Potash Comico

# DENSE MEDIA SEPARATION OF POTASH ORE USING TRI-FLO DENSE MEDIA SEPARATION

## SASKATCHEWAN MINERAL DEVELOPMENT AGREEMENT (50/50 COST SHARED)

By: Cominco Fertilizer, Potash Operations
Vanscoy, Saskatchewan

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MICROMEDIA

DENSE MEDIA SEPARATION OF POTASH ORE USING TRI-FLO DENSE MEDIA SEPARATION

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## 1.0 EXECUTIVE SUMMARY

Heavy Media Separation (HMS) technology has been successfully applied in the potash industry by International Minerals and Chemicals Corp (IMCC), in two potassium chloride processing plants at Esterhazy, Sask. The ore at each location is characteristicly coarse grained and has a low insolubles content. Cyclones are the separation devices used at each site. Each installation is a retrofit in an existing operation.

When the Saskatoon area potash processing plants were built in the 1960's HMS technology had been considered but was rejected mainly because of the high clay insolubles level in the ore. Notwithstanding the success of HMS at the previously mentioned locations, no further investigation was done for Saskatoon area ores because of the impression that the grain size of the ores would be marginal for HMS processing.

Ongoing developments in HMS technology have seemingly addressed these areas of concern. It was felt these improvements, along with the ever increasing market requirement for potash of a large particle size which must be supplied by compaction to great extent, justified an investigation into the potential of HMS for Saskatoon area potash ores.

The investigation was conducted as a joint research project between CANMET and several Saskatchewan Potash Producers' Association (SPPA) members including Central Canada Potash, International Minerals and Chemical Corp., Potash Corp. of Saskatchewan and Cominco Fertilizers Potash Operations.

This investigation included the following:

1. Laboratory studies to determine the grade-recovery relationships as a function of particle size.

2. Evaluation of HMS in comparison to existing plant performance.

3. Batch testing of a small Tri-Flo Separator at Lakefield Research in Lakefield, Ontario.

Results in each of the three areas of study have been positive and encouraging in virtually all aspects and have led to a second project involving in plant testing of a continuous Tri-Flo Separator pilot plant.

## 2.0 ACKNOWLEDGEMENTS

This project has been co-funded by CANMET and the Department of Energy, Mines and Resources under the terms of a contract issued by Supply and Services Canada. The efforts of Mrs. Maureen Renaud, Science Procurement Officer, and Dr. K.S. Moon, Scientific Authority, were especially appreciated. They showed a genuine interest in this project and were prepared to accommodate changes as the project progressed to a successful conclusion.

The Saskatchewan Potash Producers' Association is also recognized for its endorsement and encouragement of joint potash related research as a means of improving the cost effectiveness of research into common interests and problems. The project participants CCP, IMCC and PCS who supported the project with their investment of time and samples, are also acknowledged.

The following Cominco personnel capably conducted the sample testing and analyses; T.S. Jones, Development Technician and R.M. Mireau, M.L. Copeland and E.L. Ogle of the Analytical Laboratory. Without their efforts this project could not have been carried out.

## 3.0 TECHNICAL SUMMARY

### 3.1 INTRODUCTION

HMS is a process whereby ore particles of differing specific gravities can be separated by immersing them in a liquid or slurry (known as media) having a specific gravity between those of the particles being separated.

HMS processing falls into two categories; static and dynamic. Typical types of equipment used for static separations include drums, wheels or cones. Examples of Dynamic equipment include Dense Media Cyclones used in Dense Media Separation (DMS), Dyna Whirl Pool Separators, Larcodem Separators and the Tri-Flo Separator.

HMS has been widely used in the coal industry and to a lesser extent in the base metal industry. This technology has been applied in a limited number of instances in the Potash industry, two plants at Esterhazy, Saskatchewan and the other in New Mexico. Separation in these cases is typically done using cyclones.

Plants treating Saskatoon area are designed to recover potash by flotation and leaching. At the time they were built, (20 years ago) this method was chosen rather than HMS because of the grain size and the higher insolubles concentration in the Saskatoon area potash ores.

The Tri-Flo Separator, which was developed eight years ago, offers promise in overcoming some of the limitations of other dynamic equipment. In particular the friable insoluble (clays) material left in the ore after scrubbing are potentially less harmful in a Tri-Flo Separator, in comparison to a DMS plant. This is due to shorter particle/media contact times, in addition to gravity feed of ore and no pumping requirements between stages. This reduces the degradation of the insolubles which can lead to increased media viscosity. Higher media viscosity adversely affects the efficiency of separation. This has been one of the major concerns of using the HMS processes with Saskatoon area potash ores.

## 3.2 BENEFITS

The incorporation of a Heavy Media Separation processing step as envisioned by Cominco, would be a complement to, rather than a replacement of any of the processing steps currently employed. Figure "A" shows how a Tri-Flo HMS plant would be incorporated into existing facilities at Cominco.

A number of cost saving benefits could result from an effective HMS step.

a) Chemical flotation is somewhat ineffective in recovering potash particles in the 5 x 10 mesh sizes for Saskatoon area potash ores. This however corresponds to particle size requirements for "premium" potash products. HMS has the potential to recover potash particles at these sizes without having to break them down to sizes which can be recovered in flotation circuits. As a direct result of this downstream processing costs can be reduced.

b) Because the amount of potash recovered in the flotation circuits will be reduced a corresponding decrease in the amount of reagents required will occur. The only consumable in HMS is magnetite.

c) Fewer fines are generated and the workload on the crystallizer and compaction circuits can be reduced.

d) HMS circuits are quite simple to control and are thus quite easily automated.

## 3.3 TESTWORK

### 3.3.1 OBJECTIVES

This research project had three objectives;

a) To ascertain whether HMS would be suitable for Saskatoon area ores.

b) To observe and evaluate the performance of small batch. Tri-Flo separator on Saskatoon area potash ore.

c) To determine the liberation characteristics of potash ore at various points in the concentrator circuits, prior to flotation, in an effort to determine the most suitable feed material for a HMS circuit.

### 3.3.2 WORK STATEMENT

Work undertaken for this project can be categorized into the following:

a) HMS evaluation of selected plant samples by heavy liquid separation.

b) Batch pilot scale Tri-Flo HMS testwork at Lakefield Research.

3.3.2 WORK STATEMENT - (Continued)

c) Laboratory evaluation of samples resulting from this testwork.

d) Photographic analysis of particle locking characteristics in samples from Lakefield testwork.

e) Theoretical breakage of crushed middling products to produce on grade material.

f) HMS laboratory testwork on sequential plant samples to determine clay liberation characteristics at different points in the concentrator's circuits prior to flotation.

3.3.3 DETAILS & RESULTS

The details and results for the work covered in the work statement above are organized into three progress reports.

Progress Report I covered the first section of the evaluation of selected plant samples carried out in the laboratory using Tetrabromoethylene as the heavy liquid.

The second progress report continued with the evaluation of selected plant samples. It also included bench scale Tri-Flo testwork at Lakefield and the laboratory analysis of the Lakefield samples.

In the third progress report, photographic analysis of Lakefield samples was presented. Theoretical breakage of crushed middling samples to produce on grade material and sequential plant sampling was reviewed.

3.3.4 CONCLUSIONS

The project results were positive in virtually all aspects of the testwork undertaken. The following is a summary of the major conclusions drawn. More minor conclusions and support for the conclusions below can be found in the three progress reports appended.

PROGRESS REPORT I

The optimum specific gravity for separation depends upon the liberation characteristics of the KCl. At any given specific gravity both the concentrate $K_2O$ grade and recovery improve as particle size decreases. This is attributed to improved liberation as particle size decreases.

HMS proved capable of recovering between 85-97% of $K_2O$ values present in samples tested at a grade in excess of the minimum 60.5% $K_2O$ grade requirement. This compares with current rougher flotation recoveries of approximately 80%.

3.3.4 CONCLUSIONS - (Continued)

PROGRESS REPORT II

The specific gravity of the nearly pure KCl particles is very sensitive to small amounts of insoluble (clay) material associated with these values. The presence of this insoluble material has an adverse effect on separation performance with respect to recovery.

In support of the above conclusion both the normal rougher feed material and the scrubbed feed material gave a much cleaner separation than did the unscrubbed dry secondary crushing screen material in the Lakefield testwork. The normal rougher feed gave the best results with a grade of 60% $K_2O$ achieved at 85% recovery while rejecting 95% of the NaCl and 85% of the insoluble material.

PROGRESS REPORT III

The KCl/NaCl/WI associations in middling product particles are, for the most part, simple. Associations are predominantly KCl-NaCl combinations with some unscrubbed insol. Component associations are coarse grained with contact between components occurring on only a few grain boundaries.

A significant portion of the crushed middling products will be too small to be reprocessed in the Tri-Flo separator and will have to be recovered by flotation.

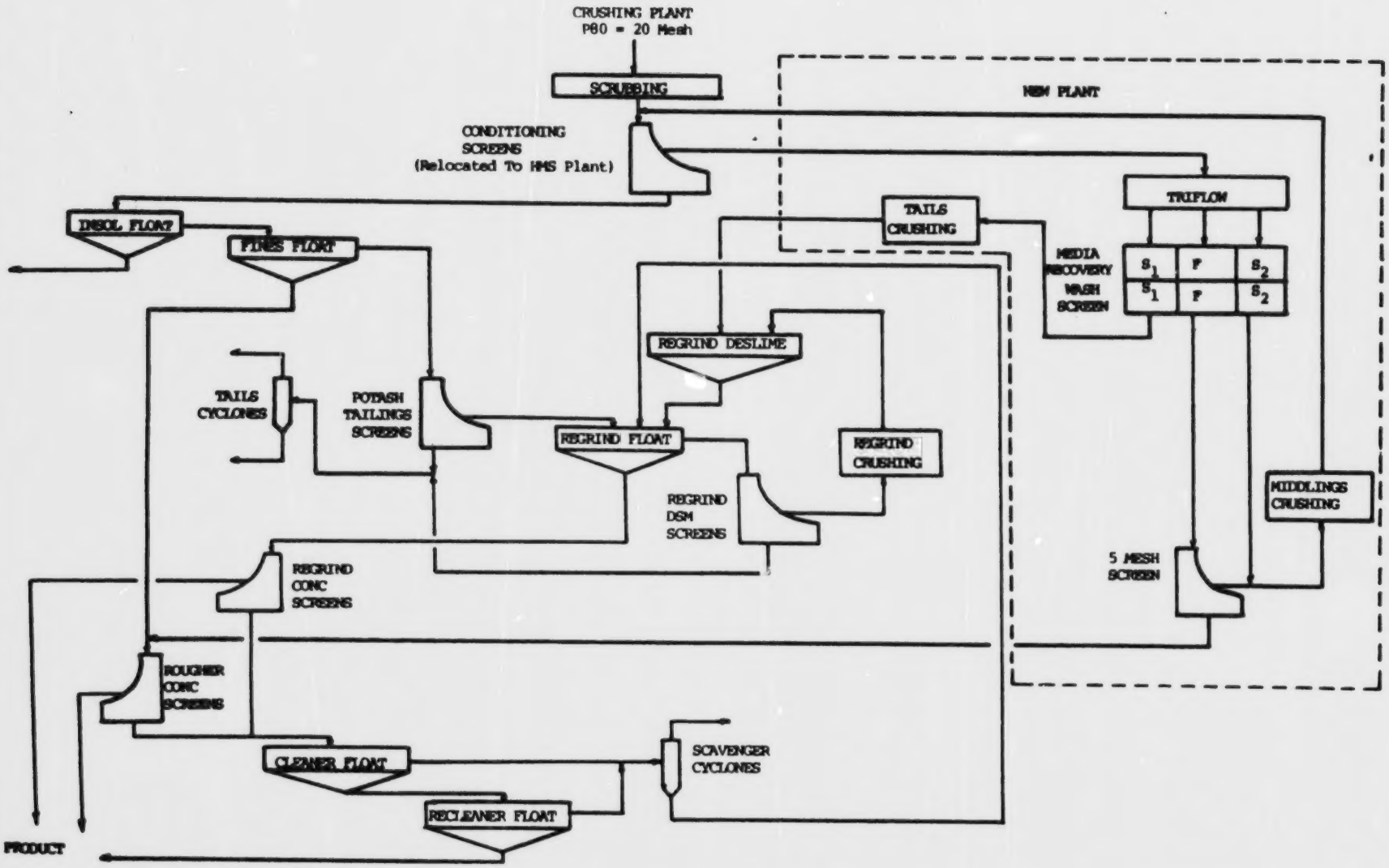
Results of testwork on plant samples show no significant improvement in recovery performance until the material reaches the rougher flotation feed circuit. This indicates that "scrubbing" of the particles continues to occur past the scrubbers and throughout the insol flotation circuit.

Scrubbing of ore particles serves two functions. It upgrades the particle which would already report to a "float product" at a given separation density and allows these particles to be recovered at product grade. Scrubbing also cleans up particles which otherwise would report as part of a middling product thereby improving recovery.

4.3.4 RECOMMENDATIONS

Based on the results of this project, further test work is recommended. This test work should be conducted using a pilot scale HMS plant (5-13 Tonnes/Hr.) and include some continuous operation. This will assist in determining the effect of ore variations and the ability to control media density. From this work the optimum percentage of middling product should be determined. The effect of insol build-up in the media, on separation performance must also be observed.

# FIGURES


CRUSHING PLANT
P80 = 20 Mesh
SCRUBBING
HMS PLANT
CONDITIONING
SCREENS
(Relocated To HMS Plant)
TRIFLOW
TAILS
CRUSHING
INSOL FLOAT
FINES FLOAT
MEDIA
RECOVERY
WASH
SCREEN
S1
F
S2
S1
F
S2
REGRIND DESLIME
TAILS
CYCLONES
POTASH
TAILINGS
SCREENS
REGRIND FLOAT
REGRIND
CRUSHING
MIDDLINGS
CRUSHING
REGRIND
DSM
SCREENS
5 MESH
SCREEN
REGRIND
CONC
SCREENS
ROUGHER
CONC
SCREENS
CLEANER FLOAT
SCAVENGER
CYCLONES
RECLEANER FLOAT
PRODUCT

# APPENDIX A

PROGRESS REPORT #1

## A. HIGHLIGHT REPORT

## DENSE MEDIUM SEPARATION OF POTASH ORE

### 1.0 GENERAL

At the beginning of November the program was initiated to determine whether or not heavy media separation technology may be applicable to a Saskatoon area potash ore. Tests were conducted on scrubbed ore in the particle size range from .833 mm to 12.5 mm to determine the liberation characteristics of the ore. The results obtained have been encouraging and have justified additional testing on a bench scale at the Lakefield Research facility, using a 70 Kg per hour Tri-Flo separator.

### 2.0 SCHEDULE

The laboratory testing carried out at the plant site has progressed well without any significant obstacles or hindrances. A total of 34 individual sets of test runs in three groupings have been carried out since commencement of this project.

2.1 Overall

| | |
|---|---|
| Control Schedule Completion | March 31, 1988 |
| Probable Completion | December 31, 1987 |

2.2 Milestones

| | |
|---|---|
| Site Testing Phase I Completion | December 22, 1987 |

### 3.0 COST SUMMARY

Expenditures for the project thus far are for labour charges only. Total time charges to this project are 298 manhours.

| | | |
|---|---|---|
| 3.1 | Control Net Estimate | $65,113.00 |
| 3.2 | Expenditure This Period | $11,920.00 |
| 3.3 | Total Expenditures | $11,920.00 |
| 3.4 | 50/50 Split Crown Portion | $ 5,960.00 |

### 4.0 OVERALL PROGRESS REVIEW

Project progress is continuing at a satisfactory pace. No problems are anticipated in meeting the deadlines or staying on the present forecast schedule.

## B. PROJECT PROGRESS

### 1.0 INTRODUCTION

The test work carried out since the beginning of November, may be organized into three categories. These first two groups of tests were conducted on ore samples including mesh sizes larger than normally processed by flotation. These tests determined the liberation characteristics of the ore, in particular, the upper particle size limit.

The third test was performed to develop a comparison of grade and recovery rates between the existing rougher flotation circuit and a heavy media separation process.

### 2.0 SCHEDULE

2.1 Laboratory testing commenced the week of November 3, 1986. Three groups of tests were carried out. The first two groups of tests were conducted to determine the separation in terms of grade and recovery of ore particles ranging from 0.833 mm to 12.5 mm. The upper size limit in the flotation operation is 3.3 mm. This third set of tests was performed to establish a direct comparison of performance between the existing flotation circuit and heavy media separation.

The first group of tests included four runs, the second included nine and the third group included twenty-one runs. The results are reported subsequently in this report.

2.2 Arrangements have been made to begin a set of bench scale heavy media separation tests on potash ore at the Lakefield Research Facility. These tests will commence on the January 19, 1987.

2.3 The work has progressed at a rate in excess of our timetable expectations.

### 3.0 REVIEW OF PROCEDURE AND RESULTS

3.1 Lab Procedure

The samples to be tested were acquired from the appropriate locations in the plant. The samples were taken to the lab and scrubbed, if required, then debrined, alcohol washed, dried and screened into the required fractions for heavy media

## 3.0 REVIEW OF PROCEDURE AND RESULTS - Continued

### 3.1 Lab Procedure - Continued

evaluation. Each fraction is added to a beaker filled with heavy media liquid. The heavy media used for the tests is acetylene tetrabromide diluted with kerosene to obtain the required specific gravity. Sink-float standards, with an accuracy of .0005 gm/cc, are used to check specific gravities.

Once the heavy medium is set at the desired specific gravity, approximately 150 grams of sample are added to the liquid and stirred. The float is skimmed off the top with a dipper-shaped screen. The sink is poured over a screen to recover the heavy media liquid. Both fractions are then dried. The dry samples are weighed and sent to the analytical lab for $K_2O$, NaCl and water insoluble analysis. The results are used to determine distributions and recoveries.

### 3.2 Data

The following samples were subjected to HMS evaluation:

GROUP 1 a) Secondary Crushing Screen Oversize

GROUP 2 a) Secondary Insoluble Flotation Tails (Rougher Feed)
b) Rougher Flotation Tails

GROUP 3 a) Secondary Crushing Screen Oversize Plus Mill Feed (Scrubbed)
b) Secondary Insoluble Flotation Tails (Rougher Feed)
c) Rougher Tails

The screen fractions from each of the plant samples were separated at each of the following specific gravities: 1.99; 2.01; 2.03; 2.05; 2.07; 2.10; 2.15; 2.20. Where insufficient sample was available, some intermediate densities were eliminated.

Over this specific gravity range, the samples would range from almost entirely sink product at 1.99 g/cc to almost entirely float product at 2.20 g/cc, giving a full set of grade recovery points.

## 3.0 REVIEW OF PROCEDURE AND RESULTS - Continued

### 3.3 Discussion of Results

The results from the first three sets of laboratory HMS testwork are included in Appendix 1.0. From these results a number of points are evident.

3.3.1 The Optimum Specific Gravity for Separation Depends Upon:

a) Particle Size

For all samples at any given specific gravity, both the float concentrate $K_2O$ grade and recovery improve as the particle size decreases. This can be expected due to the improved component liberation as particle size decreases.

b) Ore Characteristics

Comparison of results obtained in the Group 1 secondary crushing screen oversize material and the same size material in the Group 3 tests shows better grades and recoveries for the latter tests. These samples, obtained at different dates, reflect varying liberation characteristics of the ore at different points in the ore body. Similar results are found in a comparison of the secondary insoluble flotation tails and the rougher tails samples.

It would appear, based upon a minimum acceptable potash concentrate grade of 60.5% $K_2O$, that the optimum heavy media specific gravity will be approximately 2.05. Though this will not provide on grade material in the large size ranges, this material will, in general, be too big to report directly as product and will have to be crushed and retreated, in any case.

3.3.2 Excellent Grade/Recovery Performance on Current Flotation Feed Material

Examination of the secondary insol flotation tails (potash rougher feed) results in both the Group 2 and Group 3 samples indicate $K_2O$ value recoveries ranging from 85-97% at grades in excess of the minimum 60.5% $K_2O$ grade. This compares with current rougher flotation recoveries of 80%.

## 3.0 REVIEW OF PROCEDURE AND RESULTS - Continued

3.3 Discussion of Results - Continued

3.3.2 Excellent Grade/Recovery Performance on Current Flotation Feed Material - Continued

The majority of the material currently lost in the rougher circuits is coarse material (6x10 mesh). The majority of this is recovered after being crushed and refloated in a regrind circuit but at a smaller size requiring size upgrading by compaction.

This, in combination with the heavy media separators ability to recover material larger than this (1/4" x 6 mesh) will aid in the production of the sized product directly for the greatest market exists and reduce the compaction plant production requirements.

## 4.0 RECOMMENDATIONS

Based upon the results of testwork completed to date, the following work is recommended:

4.1 Further lab tests on potash rougher feed and tailings to better correlate the performance of heavy media separation versus flotation, including weight fraction data with the grade recovery data.

4.2 Bench scale piloting of continuous heavy media separation (Tri-Flo separators) be conducted in order to determine the separation efficiencies obtained in a continuous process in comparison to the near perfect separations obtained in the non continuous lab testwork.

4.3 Test the effect of slimes on the performance of the Tri-Flo separator.

4.4 Test to determine the grade/recovery characteristics of the middlings fraction after recrushing.

CLittmann/red
Vanscoy Office
January 16, 1987

# APPENDIX 1.0

GROUP I

Heavy Media Lab Work

Sec. Crush Screen O/S
-1/2" +1/4"

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | Distributions NaCl | Distributions W.I. | Calculated Head Grade K2O | Calculated Head Grade NaCl | Calculated Head Grade W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 543 | 1.99 F | 27.70 | 61.69 | 2.02 | 0.33 | 6.81 | 24.00 | 0.21 | 0.40 | 17.50 | 66.75 | 5.55 |
| 544 | S | 379.20 | 14.27 | 71.48 | 5.93 | 93.19 | 76.00 | 99.79 | 99.60 | | | |
| 545 | 2.01 F | 43.90 | 60.31 | 3.84 | 0.70 | 13.79 | 43.21 | 0.84 | 1.55 | 19.25 | 63.29 | 6.24 |
| 546 | S | 274.40 | 12.68 | 72.80 | 7.13 | 86.21 | 56.79 | 99.16 | 98.45 | | | |
| 547 | 2.03 F | 55.90 | 57.31 | 8.60 | 0.69 | 19.77 | 58.25 | 2.71 | 2.12 | 19.45 | 62.77 | 6.44 |
| 548 | S | 226.90 | 10.12 | 76.12 | 7.86 | 80.23 | 41.75 | 97.29 | 97.88 | | | |
| 549 | 2.05 F | 65.60 | 53.76 | 13.69 | 1.22 | 23.95 | 61.81 | 5.29 | 5.81 | 20.83 | 62.00 | 5.03 |
| 550 | S | 208.30 | 10.46 | 77.21 | 6.23 | 76.05 | 38.19 | 94.71 | 94.19 | | | |
| 551 | 2.07 F | 72.50 | 52.03 | 16.31 | 1.33 | 27.68 | 73.04 | 7.16 | 6.46 | 19.72 | 63.09 | 5.70 |
| 552 | S | 189.40 | 7.35 | 81.00 | 7.37 | 72.32 | 26.96 | 92.84 | 93.54 | | | |
| 553 | 2.10 F | 89.10 | 45.66 | 26.04 | 1.69 | 40.28 | 85.89 | 16.98 | 15.68 | 21.41 | 61.76 | 4.34 |
| 554 | S | 132.10 | 5.06 | 85.86 | 6.13 | 59.72 | 14.11 | 83.02 | 84.32 | | | |
| 555 | 2.15 F | 148.50 | 29.89 | 51.00 | 1.69 | 59.31 | 93.76 | 47.50 | 15.65 | 18.91 | 63.67 | 6.40 |
| 556 | S | 101.90 | 2.90 | 82.14 | 13.27 | 40.69 | 6.24 | 52.50 | 84.35 | | | |
| 557 | 2.20 F | 233.00 | 21.58 | 62.77 | 3.07 | 92.28 | 98.04 | 95.17 | 40.87 | 20.31 | 60.86 | 6.93 |
| 558 | S | 19.50 | 5.16 | 38.03 | 53.08 | 7.72 | 1.96 | 4.83 | 59.13 | | | |

Heavy Media Lab Work

Sec. Crush screen O/S
-1/4" +4 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | NaCl | W.I. | Calculated Head Grade K2O | NaCl | W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 527 | 1.99 F | 27.80 | 61.03 | 2.85 | 0.55 | 15.57 | 50.65 | 0.69 | 1.44 | 18.75 | 64.37 | 5.95 |
| 528 | S | 150.80 | 10.96 | 75.71 | 6.94 | 84.43 | 49.35 | 99.31 | 98.56 | | | |
| 529 | 2.01 F | 52.70 | 60.73 | 3.21 | 0.66 | 17.31 | 56.00 | 0.84 | 2.55 | 18.77 | 65.80 | 4.49 |
| 530 | S | 251.70 | 9.99 | 78.90 | 5.29 | 82.69 | 44.00 | 99.16 | 97.45 | | | |
| 531 | 2.03 F | 55.00 | 59.23 | 5.32 | 0.93 | 23.80 | 67.39 | 2.04 | 4.60 | 20.92 | 62.08 | 4.81 |
| 532 | S | 176.10 | 8.95 | 79.81 | 6.02 | 76.20 | 32.61 | 97.96 | 95.40 | | | |
| 533 | 2.05 F | 57.50 | 57.70 | 7.67 | 1.00 | 26.09 | 76.26 | 3.08 | 7.00 | 19.74 | 65.02 | 3.73 |
| 534 | S | 162.90 | 6.34 | 85.27 | 4.69 | 73.91 | 23.74 | 96.92 | 93.00 | | | |
| 535 | 2.07 F | 57.70 | 54.11 | 13.14 | 1.21 | 28.33 | 80.47 | 5.63 | 9.23 | 19.05 | 66.14 | 3.71 |
| 536 | S | 146.00 | 5.19 | 87.09 | 4.70 | 71.67 | 19.53 | 94.37 | 90.77 | | | |
| 537 | 2.10 F | 64.50 | 52.77 | 15.23 | 1.24 | 31.80 | 87.33 | 7.52 | 7.60 | 19.22 | 64.39 | 5.19 |
| 538 | S | 138.30 | 3.57 | 87.32 | 7.03 | 68.20 | 12.67 | 92.48 | 92.40 | | | |
| 539 | 2.15 F | 97.70 | 37.75 | 38.77 | 1.48 | 48.37 | 95.41 | 29.00 | 14.20 | 19.14 | 64.67 | 5.04 |
| 540 | S | 104.30 | 1.70 | 88.93 | 8.38 | 51.63 | 4.59 | 71.00 | 85.80 | | | |
| 541 | 2.20 F | 197.10 | 19.52 | 66.25 | 2.85 | 95.59 | 98.66 | 97.57 | 52.83 | 18.91 | 64.91 | 5.16 |
| 542 | S | 9.10 | 5.75 | 35.79 | 55.11 | 4.41 | 1.34 | 2.43 | 47.17 | | | |

Heavy Media Lab Work

Sec. Crush Screen O/S
-4 + 5 Mesh

| Sample #: | SG | wt. | % K2O | % NaCl | % W.I. | wt %: | Distributions K2O | NaCl | W.I. | Calculated Head Grade K2O | NaCl | W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 517 | 2.01 F | 43.90 | 60.92 | 2.98 | 0.59 | 21.76 | 68.62 | 1.00 | 2.69 | 19.32 | 64.64 | 4.78 |
| 518 | S | 157.80 | 7.75 | 81.79 | 5.94 | 78.24 | 31.38 | 99.00 | 97.31 | | | |
| 519 | 2.05 F | 52.90 | 58.69 | 6.08 | 1.02 | 26.16 | 81.89 | 2.43 | 5.38 | 18.75 | 65.36 | 4.96 |
| 520 | S | 149.30 | 4.60 | 86.36 | 6.36 | 73.84 | 18.11 | 97.57 | 94.62 | | | |
| 521 | 2.10 F | 69.60 | 53.91 | 13.46 | 1.21 | 34.73 | 91.51 | 7.42 | 9.11 | 20.46 | 63.01 | 4.61 |
| 522 | S | 130.80 | 2.66 | 89.37 | 6.42 | 65.27 | 8.49 | 92.58 | 90.89 | | | |
| 523 | 2.15 F | 93.20 | 43.64 | 29.66 | 1.26 | 46.51 | 95.98 | 22.33 | 12.34 | 21.15 | 61.78 | 4.75 |
| 524 | S | 107.20 | 1.59 | 89.70 | 7.78 | 53.49 | 4.02 | 77.67 | 87.66 | | | |
| 525 | 2.20 F | 186.60 | 19.00 | 67.65 | 2.28 | 92.88 | 97.85 | 96.00 | 35.29 | 18.04 | 65.45 | 6.00 |
| 526 | S | 14.30 | 5.45 | 36.81 | 54.56 | 7.12 | 2.15 | 4.00 | 64.71 | | | |

Heavy Media Lab Work

Sec. Crush Screen O/S
-5 + 6 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | Distributions NaCl | Distributions W.I. | Calculated Head Grade K2O | Calculated Head Grade NaCl | Calculated Head Grade W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 507 | 2.00 F | 44.60 | 61.87 | 1.54 | 0.53 | 22.31 | 70.26 | 0.54 | 2.13 | 19.65 | 63.36 | 5.54 |
| 508 | S | 155.30 | 7.52 | 81.11 | 6.98 | 77.69 | 29.74 | 99.46 | 97.87 | | | |
| 509 | 2.05 F | 52.80 | 58.79 | 5.88 | 1.08 | 26.44 | 82.64 | 2.41 | 4.93 | 18.81 | 64.44 | 5.79 |
| 510 | S | 146.90 | 4.44 | 85.49 | 7.48 | 73.56 | 17.36 | 97.59 | 95.07 | | | |
| 511 | 2.10 F | 63.20 | 54.70 | 12.24 | 1.17 | 31.63 | 90.55 | 6.05 | 6.44 | 19.11 | 64.01 | 5.74 |
| 512 | S | 136.60 | 2.64 | 87.96 | 7.86 | 68.37 | 9.45 | 93.95 | 93.56 | | | |
| 513 | 2.15 F | 139.00 | 25.92 | 57.89 | 1.08 | 69.12 | 96.78 | 60.65 | 15.80 | 18.51 | 65.97 | 4.72 |
| 514 | S | 62.10 | 1.93 | 84.07 | 12.88 | 30.88 | 3.22 | 39.35 | 84.20 | | | |
| 515 | 2.20 F | 189.20 | 19.82 | 66.05 | 2.58 | 93.99 | 98.71 | 96.68 | 40.97 | 18.87 | 64.21 | 5.92 |
| 516 | S | 12.10 | 4.04 | 35.49 | 58.12 | 6.01 | 1.29 | 3.32 | 59.03 | | | |

GROUP II

Heavy Media Lab Work

Sec. Insol Tails
-6 + 8 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | Distributions NaCl | Distributions W.I. | Calculated Head Grade K2O | Calculated Head Grade NaCl | Calculated Head Grade W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 560 | 1.99 F | 60.20 | 62.20 | 1.35 | 0.20 | 27.18 | 72.97 | 0.59 | 4.43 | 23.17 | 62.11 | 1.23 |
| 561 | S | 161.30 | 8.60 | 84.78 | 1.61 | 72.82 | 27.03 | 99.41 | 95.57 | | | |
| 562 | 2.01 F | 52.70 | 62.00 | 1.48 | 0.38 | 29.04 | 78.74 | 0.69 | 8.38 | 22.86 | 62.49 | 1.32 |
| 563 | S | 128.80 | 6.85 | 87.45 | 1.70 | 70.96 | 21.26 | 99.31 | 91.62 | | | |
| 564 | 2.03 F | 40.70 | 61.00 | 2.94 | 0.51 | 31.95 | 85.13 | 1.50 | 12.60 | 22.89 | 62.48 | 1.29 |
| 565 | S | 86.70 | 5.00 | 90.43 | 1.66 | 68.05 | 14.87 | 98.50 | 87.40 | | | |
| 566 | 2.05 F | 35.70 | 59.88 | 4.58 | 0.64 | 35.66 | 89.51 | 2.68 | 17.44 | 23.86 | 60.93 | 1.31 |
| 567 | S | 64.40 | 3.89 | 92.16 | 1.68 | 64.34 | 10.49 | 97.32 | 82.56 | | | |
| 568 | 2.07 F | 37.60 | 58.76 | 6.22 | 0.77 | 36.22 | 91.15 | 3.65 | 21.26 | 23.35 | 61.72 | 1.31 |
| 569 | S | 66.20 | 3.24 | 93.25 | 1.62 | 63.78 | 8.85 | 96.35 | 78.74 | | | |
| 570 | 2.10 F | 43.80 | 55.20 | 11.85 | 0.78 | 42.77 | 96.15 | 8.48 | 24.67 | 24.56 | 59.78 | 1.35 |
| 571 | S | 58.60 | 1.65 | 95.61 | 1.78 | 57.23 | 3.85 | 91.52 | 75.33 | | | |
| 572 | 2.15 F | 116.70 | 38.30 | 38.38 | 1.00 | 60.53 | 98.81 | 37.81 | 42.67 | 23.46 | 61.45 | 1.42 |
| 573 | S | 76.10 | 0.71 | 96.82 | 2.06 | 39.47 | 1.19 | 62.19 | 57.33 | | | |
| 574 | 2.20 F | 218.50 | 24.05 | 60.74 | 1.19 | 97.15 | 99.77 | 96.32 | 69.63 | 23.42 | 61.27 | 1.66 |
| 575 | S | 6.40 | 1.88 | 79.30 | 17.72 | 2.85 | 0.23 | 3.68 | 30.37 | | | |

Heavy Media Lab Work

Sec. Insol Tails
-8 + 10 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | NaCl | W.I. | Calculated Head Grade K2O | NaCl | W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 576 | 1.99 F | 82.30 | 62.53 | 0.94 | 0.11 | 32.30 | 78.48 | 0.52 | 3.30 | 25.73 | 58.22 | 1.08 |
| 577 | S | 172.50 | 8.18 | 85.55 | 1.54 | 67.70 | 21.52 | 99.48 | 96.70 | | | |
| 578 | 2.01 F | 68.10 | 62.33 | 1.09 | 0.25 | 36.17 | 87.29 | 0.68 | 8.63 | 25.82 | 58.07 | 1.05 |
| 579 | S | 120.20 | 5.14 | 90.36 | 1.50 | 63.83 | 12.71 | 99.32 | 91.37 | | | |
| 580 | 2.03 F | 66.20 | 61.64 | 2.04 | 0.44 | 37.19 | 90.82 | 1.29 | 14.63 | 25.24 | 58.94 | 1.12 |
| 581 | S | 111.80 | 3.69 | 92.64 | 1.52 | 62.81 | 9.18 | 98.71 | 85.37 | | | |
| 582 | 2.05 F | 71.70 | 61.15 | 2.65 | 0.56 | 38.97 | 93.26 | 1.77 | 19.15 | 25.55 | 58.42 | 1.14 |
| 583 | S | 112.30 | 2.82 | 94.03 | 1.51 | 61.03 | 6.74 | 98.23 | 80.85 | | | |
| 584 | 2.07 F | 67.30 | 60.43 | 3.86 | 0.67 | 39.08 | 94.98 | 2.53 | 22.63 | 24.87 | 59.56 | 1.16 |
| 585 | S | 104.90 | 2.05 | 95.29 | 1.47 | 60.92 | 5.02 | 97.47 | 77.37 | | | |
| 586 | 2.10 F | 82.20 | 58.43 | 6.83 | 0.68 | 44.67 | 97.16 | 5.42 | 26.93 | 26.87 | 56.35 | 1.13 |
| 587 | S | 101.80 | 1.38 | 96.33 | 1.49 | 55.33 | 2.84 | 94.58 | 73.07 | | | |
| 588 | 2.15 F | 123.40 | 50.21 | 19.78 | 0.74 | 55.29 | 99.28 | 20.06 | 33.33 | 27.96 | 54.51 | 1.23 |
| 589 | S | 99.80 | 0.45 | 97.46 | 1.83 | 44.71 | 0.72 | 79.94 | 66.67 | | | |
| 590 | 2.20 F | 259.20 | 26.90 | 56.37 | 1.05 | 97.81 | 99.85 | 97.00 | 71.14 | 26.35 | 56.84 | 1.44 |
| 591 | S | 5.80 | 1.85 | 78.03 | 19.04 | 2.19 | 0.15 | 3.00 | 28.86 | | | |

Heavy Media Lab Work

Sec. Insol Tails
-10 + 14 Mesh

| | | | | | | | Distributions | | | | Calculated Head Grade | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | K2O | NaCl | W.I. | K2O | NaCl | W.I. |
| 592 | 1.99 F | 91.90 | 62.64 | 0.75 | 0.10 | 35.69 | 82.04 | 0.48 | 3.81 | 27.25 | 55.93 | 0.94 |
| 593 | S | 165.60 | 7.61 | 86.55 | 1.40 | 64.31 | 17.96 | 99.52 | 96.19 | | | |
| 594 | 2.01 F | 76.90 | 62.29 | 1.18 | 0.22 | 40.60 | 91.33 | 0.87 | 9.96 | 27.69 | 55.27 | 0.90 |
| 595 | S | 112.50 | 4.04 | 92.25 | 1.36 | 59.40 | 8.67 | 99.13 | 90.04 | | | |
| 596 | 2.03 F | 80.50 | 62.03 | 1.47 | 1.31 | 41.13 | 93.97 | 1.08 | 41.13 | 27.15 | 56.11 | 1.31 |
| 597 | S | 115.20 | 2.78 | 94.29 | 1.31 | 58.87 | 6.03 | 98.92 | 58.87 | | | |
| 598 | 2.05 F | 85.50 | 61.43 | 2.36 | 0.41 | 43.53 | 95.56 | 1.88 | 19.20 | 27.98 | 54.78 | 0.93 |
| 599 | S | 110.90 | 2.20 | 95.19 | 1.33 | 56.47 | 4.44 | 98.12 | 80.80 | | | |
| 600 | 2.07 F | 83.80 | 60.94 | 3.06 | 0.48 | 44.69 | 96.99 | 2.50 | 22.98 | 28.08 | 54.62 | 0.93 |
| 601 | S | 103.70 | 1.53 | 96.28 | 1.30 | 55.31 | 3.01 | 97.50 | 77.02 | | | |
| 602 | 2.10 F | 82.80 | 59.45 | 5.34 | 0.56 | 47.18 | 98.46 | 4.67 | 27.94 | 28.49 | 53.97 | 0.95 |
| 603 | S | 92.70 | 0.83 | 97.40 | 1.29 | 52.82 | 1.54 | 95.33 | 72.06 | | | |
| 604 | 2.15 F | 116.80 | 51.90 | 17.26 | 0.59 | 54.22 | 99.53 | 17.24 | 33.46 | 28.28 | 54.29 | 0.96 |
| 605 | S | 98.60 | 0.29 | 98.15 | 1.39 | 45.78 | 0.47 | 82.76 | 66.54 | | | |
| 606 | 2.20 F | 311.80 | 28.61 | 53.84 | 0.87 | 98.02 | 99.88 | 97.12 | 70.02 | 28.08 | 54.34 | 1.22 |
| 607 | S | 6.30 | 1.66 | 78.93 | 18.44 | 1.98 | 0.12 | 2.88 | 29.98 | | | |

Heavy Media Lab Work

Sec. Insol Tails
-14 + 20 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | Distributions NaCl | Distributions W.I. | Calculated Head Grade K2O | Calculated Head Grade NaCl | Calculated Head Grade W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 608 | 1.99 F | 94.20 | 62.84 | 0.42 | 0.11 | 36.85 | 77.20 | 0.30 | 4.03 | 30.00 | 51.51 | 1.01 |
| 609 | S | 161.40 | 10.83 | 81.33 | 1.53 | 63.15 | 22.80 | 99.70 | 95.97 | | | |
| 610 | 2.01 F | 84.80 | 62.57 | 0.77 | 0.19 | 44.42 | 93.32 | 0.66 | 10.46 | 29.78 | 52.05 | 0.81 |
| 611 | S | 106.10 | 3.58 | 93.03 | 1.30 | 55.58 | 6.68 | 99.34 | 89.54 | | | |
| 612 | 2.03 F | 84.10 | 62.35 | 1.02 | 0.29 | 45.17 | 95.64 | 0.88 | 14.85 | 29.44 | 52.51 | 0.88 |
| 613 | S | 102.10 | 2.34 | 94.93 | 1.37 | 54.83 | 4.36 | 99.12 | 85.15 | | | |
| 614 | 2.05 F | 90.80 | 62.09 | 1.35 | 0.37 | 46.37 | 97.11 | 1.20 | 20.12 | 29.65 | 52.21 | 0.85 |
| 615 | S | 105.00 | 1.60 | 96.20 | 1.27 | 53.63 | 2.89 | 98.80 | 79.88 | | | |
| 616 | 2.07 F | 95.20 | 61.80 | 1.75 | 0.43 | 47.41 | 97.94 | 1.60 | 23.67 | 29.91 | 51.79 | 0.86 |
| 617 | S | 105.60 | 1.17 | 96.90 | 1.25 | 52.59 | 2.06 | 98.40 | 76.33 | | | |
| 618 | 2.10 F | 96.40 | 60.28 | 4.10 | 0.49 | 48.91 | 98.77 | 3.87 | 26.82 | 29.85 | 51.86 | 0.89 |
| 619 | S | 100.70 | 0.72 | 97.58 | 1.28 | 51.09 | 1.23 | 96.13 | 73.18 | | | |
| 620 | 2.15 F | 133.90 | 51.46 | 18.07 | 0.48 | 58.88 | 99.76 | 20.84 | 32.31 | 30.38 | 51.05 | 0.87 |
| 621 | S | 93.50 | 0.18 | 98.28 | 1.44 | 41.12 | 0.24 | 79.16 | 67.69 | | | |
| 622 | 2.20 F | 372.30 | 29.97 | 51.72 | 0.84 | 98.57 | 99.92 | 97.86 | 74.83 | 29.57 | 52.09 | 1.11 |
| 623 | S | 5.40 | 1.71 | 77.81 | 19.48 | 1.43 | 0.08 | 2.14 | 25.17 | | | |

Heavy Media Lab Work

Rougher Tails
+6 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | Distributions NaCl | Distributions W.I. | Calculated Head Grade K2O | Calculated Head Grade NaCl | Calculated Head Grade W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 624 | 1.99 F | 20.60 | 62.15 | 1.52 | 0.11 | 16.78 | 54.78 | 0.37 | 1.69 | 19.03 | 68.78 | 1.09 |
| 625 | S | 102.20 | 10.34 | 82.34 | 1.29 | 83.22 | 45.22 | 99.63 | 98.31 | | | |
| 626 | 2.03 F | 28.90 | 60.22 | 4.21 | 0.47 | 23.75 | 74.14 | 1.46 | 9.29 | 19.29 | 68.27 | 1.20 |
| 627 | S | 92.80 | 6.54 | 88.22 | 1.43 | 76.25 | 25.86 | 98.54 | 90.71 | | | |
| 628 | 2.07 F | 40.20 | 56.27 | 9.96 | 0.62 | 31.24 | 86.03 | 4.68 | 17.58 | 20.43 | 66.45 | 1.10 |
| 629 | S | 88.50 | 4.15 | 92.11 | 1.32 | 68.76 | 13.97 | 95.32 | 82.42 | | | |
| 630 | 2.15 F | 73.00 | 36.83 | 40.84 | 0.86 | 61.04 | 99.19 | 39.57 | 46.50 | 22.66 | 63.00 | 1.13 |
| 631 | S | 46.60 | 0.47 | 97.71 | 1.55 | 38.96 | 0.81 | 60.43 | 53.50 | | | |

Heavy Media Lab Work

Rougher Tails
-6 + 8 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | Distributions NaCl | Distributions W.I. | Calculated Head Grade K2O | Calculated Head Grade NaCl | Calculated Head Grade W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 632 | 1.99 F | 48.40 | 62.52 | 0.96 | 0.08 | 16.45 | 56.81 | 0.22 | 1.17 | 18.11 | 70.21 | 1.12 |
| 633 | S | 245.80 | 9.36 | 83.85 | 1.33 | 83.55 | 43.19 | 99.78 | 98.83 | | | |
| 634 | 2.01 F | 46.50 | 61.90 | 1.60 | 0.42 | 20.31 | 74.81 | 0.45 | 7.05 | 16.80 | 72.20 | 1.21 |
| 635 | S | 182.50 | 5.31 | 90.19 | 1.41 | 79.69 | 25.19 | 99.55 | 92.95 | | | |
| 636 | 2.03 F | 46.50 | 60.41 | 3.81 | 0.57 | 22.33 | 79.32 | 1.19 | 10.03 | 17.01 | 71.81 | 1.27 |
| 637 | S | 161.70 | 4.53 | 91.36 | 1.47 | 77.67 | 20.68 | 98.81 | 89.97 | | | |
| 638 | 2.05 F | 56.20 | 59.73 | 4.89 | 0.57 | 26.83 | 84.95 | 1.90 | 13.67 | 18.86 | 69.03 | 1.12 |
| 639 | S | 153.30 | 3.88 | 92.54 | 1.32 | 73.17 | 15.05 | 98.10 | 86.33 | | | |
| 640 | 2.07 F | 55.30 | 57.43 | 8.38 | 0.72 | 26.62 | 88.23 | 3.13 | 16.02 | 17.33 | 71.37 | 1.20 |
| 641 | S | 152.40 | 2.78 | 94.23 | 1.37 | 73.38 | 11.77 | 96.87 | 83.98 | | | |
| 642 | 2.10 F | 82.40 | 53.25 | 14.88 | 0.83 | 38.38 | 95.59 | 8.79 | 26.83 | 21.38 | 64.97 | 1.19 |
| 643 | S | 132.30 | 1.53 | 96.17 | 1.41 | 61.62 | 4.41 | 91.21 | 73.17 | | | |
| 644 | 2.15 F | 108.00 | 37.18 | 40.30 | 0.85 | 50.80 | 99.35 | 29.79 | 36.45 | 19.01 | 68.72 | 1.18 |
| 645 | S | 104.60 | 0.25 | 98.07 | 1.53 | 49.20 | 0.65 | 70.21 | 63.55 | | | |
| 646 | 2.20 F | 306.30 | 16.19 | 73.53 | 0.84 | 96.62 | 99.70 | 96.32 | 58.53 | 15.69 | 73.76 | 1.39 |
| 647 | S | 10.70 | 1.41 | 80.37 | 17.04 | 3.38 | 0.30 | 3.68 | 41.47 | | | |

Heavy Media Lab Work

Rougher Tails
-8 + 10 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | Distributions NaCl | Distributions W.I. | Calculated Head Grade K2O | Calculated Head Grade NaCl | Calculated Head Grade W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 648 | 1.99 F | 22.00 | 62.76 | 0.49 | 0.17 | 7.78 | 47.19 | 0.05 | 1.20 | 10.35 | 82.51 | 1.10 |
| 649 | S | 260.60 | 5.93 | 89.43 | 1.18 | 92.22 | 52.81 | 99.95 | 98.80 | | | |
| 650 | 2.01 F | 22.80 | 61.81 | 1.44 | 0.72 | 10.80 | 63.78 | 0.19 | 5.94 | 10.47 | 82.12 | 1.31 |
| 651 | S | 188.30 | 4.25 | 91.89 | 1.38 | 89.20 | 36.22 | 99.81 | 94.06 | | | |
| 652 | 2.03 F | 20.50 | 60.56 | 3.17 | 0.97 | 10.61 | 71.97 | 0.40 | 8.56 | 8.93 | 84.67 | 1.20 |
| 653 | S | 172.70 | 2.80 | 94.34 | 1.23 | 89.39 | 28.03 | 99.60 | 91.44 | | | |
| 654 | 2.05 F | 17.60 | 58.89 | 5.63 | 1.16 | 11.45 | 75.96 | 0.76 | 10.95 | 8.88 | 84.74 | 1.21 |
| 655 | S | 136.10 | 2.41 | 94.97 | 1.22 | 88.55 | 24.04 | 99.24 | 89.05 | | | |
| 656 | 2.07 F | 23.30 | 56.66 | 8.69 | 1.63 | 14.64 | 83.57 | 1.53 | 18.76 | 9.92 | 83.03 | 1.27 |
| 657 | S | 135.90 | 1.91 | 95.77 | 1.21 | 85.36 | 16.43 | 98.47 | 81.24 | | | |
| 658 | 2.10 F | 28.20 | 49.33 | 20.27 | 1.65 | 16.66 | 91.63 | 3.99 | 21.56 | 8.97 | 84.54 | 1.27 |
| 659 | S | 141.10 | 0.90 | 97.38 | 1.20 | 83.34 | 8.37 | 96.01 | 78.44 | | | |
| 660 | 2.15 F | 59.10 | 26.55 | 56.91 | 1.07 | 34.99 | 99.03 | 23.75 | 28.71 | 9.38 | 83.85 | 1.30 |
| 661 | S | 109.80 | 0.14 | 98.35 | 1.43 | 65.01 | 0.97 | 76.25 | 71.29 | | | |
| 662 | 2.20 F | 326.90 | 9.34 | 84.43 | 0.79 | 96.12 | 99.39 | 96.27 | 53.86 | 9.03 | 84.30 | 1.41 |
| 663 | S | 13.20 | 1.43 | 80.98 | 16.76 | 3.88 | 0.61 | 3.73 | 46.14 | | | |

Heavy Media Lab Work

Rougher Tails
-10 + 14 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | Distributions NaCl | Distributions W.I. | Calculated Head Grade K2O | Calculated Head Grade NaCl | Calculated Head Grade W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 664 | 1.99 F | 5.70 | 62.62 | 0.71 | 0.17 | 1.87 | 34.18 | 0.01 | 0.29 | 3.43 | 93.48 | 1.09 |
| 665 | S | 298.90 | 2.30 | 95.25 | 1.11 | 98.13 | 65.82 | 99.99 | 99.71 | | | |
| 666 | 2.01 F | 8.20 | 61.38 | 2.15 | 0.69 | 2.93 | 49.36 | 0.07 | 1.68 | 3.64 | 93.03 | 1.20 |
| 667 | S | 271.80 | 1.90 | 95.77 | 1.22 | 97.07 | 50.64 | 99.93 | 98.32 | | | |
| 668 | 2.03 F | 4.90 | 61.02 | 2.34 | 1.07 | 2.64 | 53.43 | 0.07 | 2.59 | 3.01 | 94.14 | 1.09 |
| 669 | S | 181.00 | 1.44 | 96.63 | 1.09 | 97.36 | 46.57 | 99.93 | 97.41 | | | |
| 670 | 2.05 F | 6.50 | 58.66 | 5.73 | 1.42 | 3.67 | 62.52 | 0.23 | 4.65 | 3.44 | 93.43 | 1.12 |
| 671 | S | 170.60 | 1.34 | 96.77 | 1.11 | 96.33 | 37.48 | 99.77 | 95.35 | | | |
| 672 | 2.07 F | 7.40 | 54.58 | 11.94 | 1.67 | 4.05 | 70.38 | 0.52 | 5.92 | 3.14 | 93.88 | 1.14 |
| 673 | S | 175.20 | 0.97 | 97.34 | 1.12 | 95.95 | 29.62 | 99.48 | 94.08 | | | |
| 674 | 2.10 F | 12.00 | 43.10 | 29.80 | 1.93 | 6.74 | 86.40 | 2.15 | 11.62 | 3.36 | 93.55 | 1.12 |
| 675 | S | 166.10 | 0.49 | 98.16 | 1.06 | 93.26 | 13.60 | 97.85 | 88.38 | | | |
| 676 | 2.15 F | 42.00 | 16.41 | 73.10 | 0.93 | 20.14 | 99.76 | 15.73 | 16.02 | 3.31 | 93.58 | 1.17 |
| 677 | S | 166.50 | 0.01 | 98.75 | 1.23 | 79.86 | 0.24 | 84.27 | 83.98 | | | |
| 678 | 2.20 F | 289.60 | 3.48 | 93.81 | 0.68 | 95.42 | 98.85 | 95.95 | 46.79 | 3.36 | 93.29 | 1.39 |
| 679 | S | 13.90 | 0.84 | 82.56 | 16.11 | 4.58 | 1.15 | 4.05 | 53.21 | | | |

Heavy Media Lab Work

Rougher Tails
-14 + 20 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | Distributions NaCl | Distributions W.I. | Calculated Head Grade K2O | Calculated Head Grade NaCl | Calculated Head Grade W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 680 | 1.99 F | 1.70 | 62.20 | 1.39 | 0.15 | 0.56 | 35.41 | 0.01 | 0.08 | 0.99 | 97.43 | 1.02 |
| 681 | S | 301.40 | 0.64 | 97.97 | 1.02 | 99.44 | 64.59 | 99.99 | 99.92 | | | |
| 682 | 2.01 F | 1.70 | 61.61 | 1.87 | 0.60 | 0.84 | 45.36 | 0.02 | 0.46 | 1.14 | 97.09 | 1.10 |
| 683 | S | 200.30 | 0.63 | 97.90 | 1.10 | 99.16 | 54.64 | 99.98 | 99.54 | | | |
| 684 | 2.03 F | 1.30 | 60.93 | 2.55 | 1.00 | 0.80 | 48.02 | 0.02 | 0.82 | 1.01 | 97.43 | 0.97 |
| 685 | S | 161.80 | 0.53 | 98.19 | 0.97 | 99.20 | 51.98 | 99.98 | 99.18 | | | |
| 686 | 2.05 F | | NO | SAMPLE | | | | | | | | |
| 687 | S | 145.90 | 0.47 | 98.23 | 1.03 | | | | | | | |
| 688 | 2.07 F | 1.30 | 56.27 | 9.58 | 1.35 | 0.97 | 57.84 | 0.10 | 1.15 | 0.94 | 97.38 | 1.13 |
| 689 | S | 133.30 | 0.40 | 98.24 | 1.13 | 99.03 | 42.16 | 99.90 | 98.85 | | | |
| 690 | 2.10 F | 2.80 | 41.14 | 33.01 | 1.87 | 2.04 | 80.34 | 0.69 | 3.76 | 1.05 | 97.33 | 1.02 |
| 691 | S | 134.20 | 0.21 | 98.67 | 1.00 | 97.96 | 19.66 | 99.31 | 96.24 | | | |
| 692 | 2.15 F | 16.10 | 9.44 | 84.18 | 0.88 | 11.43 | 99.19 | 9.89 | 10.20 | 1.09 | 97.29 | 0.99 |
| 693 | S | 124.70 | 0.01 | 98.98 | 1.00 | 88.57 | 0.81 | 90.11 | 89.80 | | | |
| 694 | 2.20 F | 231.80 | 1.40 | 97.24 | 0.58 | 95.31 | 97.37 | 95.97 | 42.90 | 1.37 | 96.58 | 1.29 |
| 695 | S | 11.40 | 0.77 | 83.08 | 15.70 | 4.69 | 2.63 | 4.03 | 57.10 | | | |

GROUP III

Heavy Media Lab Work

SCSO/S Plus Mill Feed (Scrubbed)
-1/2" +1/4"

| | | | | | | | Distributions | | | | Calculated Head Grade | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | | wt % | K2O | NaCl | W.I. | K2O | NaCl | W.I. |
| 854 | 1.99 F | 10.70 | 61.40 | 1.54 | 0.37 | | 3.98 | 12.87 | 0.09 | 0.37 | 19.01 | 65.89 | 3.99 |
| 855 | S | 257.90 | 17.25 | 68.56 | 4.14 | | 96.02 | 87.13 | 99.91 | 99.63 | | | |
| 856 | 2.01 F | 15.70 | 55.94 | 6.74 | 0.79 | | 6.10 | 17.94 | 0.62 | 1.51 | 19.02 | 66.47 | 3.18 |
| 857 | S | 241.70 | 16.62 | 70.35 | 3.34 | | 93.90 | 82.06 | 99.38 | 98.49 | | | |
| 858 | 2.03 F | 24.70 | 50.95 | 11.41 | 1.30 | | 11.17 | 33.77 | 1.85 | 3.98 | 16.85 | 68.95 | 3.65 |
| 859 | S | 196.50 | 12.56 | 76.18 | 3.94 | | 88.83 | 66.23 | 98.15 | 96.02 | | | |
| 860 | 2.05 F | 43.00 | 41.83 | 20.39 | 1.52 | | 20.07 | 48.17 | 6.18 | 7.98 | 17.43 | 66.21 | 3.82 |
| 861 | S | 171.30 | 11.30 | 77.71 | 4.40 | | 79.93 | 51.83 | 93.82 | 92.02 | | | |
| 862 | 2.07 F | 38.60 | 40.70 | 21.46 | 1.61 | | 20.16 | 49.96 | 6.33 | 10.40 | 16.42 | 68.37 | 3.12 |
| 863 | S | 152.90 | 10.29 | 80.21 | 3.50 | | 79.84 | 50.04 | 93.67 | 89.60 | | | |
| 864 | 2.10 F | 72.60 | 38.56 | 37.00 | 1.97 | | 40.47 | 83.50 | 22.26 | 25.32 | 18.69 | 67.27 | 3.15 |
| 865 | S | 106.80 | 5.18 | 87.85 | 3.95 | | 59.53 | 16.50 | 77.74 | 74.68 | | | |
| 866 | 2.15 F | 163.10 | 28.71 | 52.90 | 1.66 | | 79.29 | 97.66 | 69.77 | 44.03 | 23.31 | 60.12 | 2.99 |
| 867 | S | 42.60 | 2.63 | 87.76 | 8.08 | | 20.71 | 2.34 | 30.23 | 55.97 | | | |
| 868 | 2.20 F | 290.60 | 18.62 | 67.94 | 2.57 | | 94.44 | 97.82 | 95.22 | 58.55 | 17.98 | 67.38 | 4.15 |
| 869 | S | 17.10 | 7.05 | 57.92 | 30.92 | | 5.56 | 2.18 | 4.78 | 41.45 | | | |

Heavy Media Lab Work

SCSO/S Plus Mill Feed (Scrubbed)
-1/4" +4 Mesh

| | | | | | | | Distributions | | | | Calculated Head Grade | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | K2O | NaCl | W.I. | K2O | NaCl | W.I. |
| 870 | 1.99 F | 20.70 | 61.66 | 1.26 | 0.41 | 8.20 | 27.37 | 0.15 | 1.46 | 18.48 | 68.38 | 2.31 |
| 871 | S | 231.70 | 14.62 | 74.38 | 2.48 | 91.80 | 72.63 | 99.85 | 98.54 | | | |
| 872 | 2.01 F | 32.10 | 58.46 | 4.27 | 0.70 | 15.74 | 51.66 | 0.97 | 4.90 | 17.81 | 69.16 | 2.25 |
| 873 | S | 171.80 | 10.22 | 81.28 | 2.54 | 84.26 | 48.34 | 99.03 | 95.10 | | | |
| 874 | 2.03 F | 33.30 | 54.34 | 8.36 | 0.75 | 18.45 | 50.85 | 2.36 | 5.68 | 19.71 | 65.46 | 2.44 |
| 875 | S | 147.20 | 11.88 | 78.38 | 2.82 | 81.55 | 49.15 | 97.64 | 94.32 | | | |
| 876 | 2.05 F | 40.30 | 48.67 | 13.84 | 1.05 | 22.24 | 62.56 | 4.53 | 8.30 | 17.30 | 68.00 | 2.82 |
| 877 | S | 140.90 | 8.33 | 83.49 | 3.32 | 77.76 | 37.44 | 95.47 | 91.70 | | | |
| 878 | 2.07 F | 53.40 | 51.37 | 17.63 | 1.06 | 31.71 | 77.64 | 8.78 | 10.77 | 20.98 | 63.67 | 3.12 |
| 879 | S | 115.00 | 6.87 | 85.05 | 4.08 | 68.29 | 22.36 | 91.22 | 89.23 | | | |
| 880 | 2.10 F | 62.00 | 42.41 | 31.47 | 1.40 | 37.19 | 85.67 | 17.16 | 19.56 | 18.41 | 68.19 | 2.66 |
| 881 | S | 104.70 | 4.20 | 89.94 | 3.41 | 62.81 | 14.33 | 82.84 | 80.44 | | | |
| 882 | 2.15 F | 131.60 | 28.33 | 53.56 | 1.60 | 65.12 | 97.65 | 51.69 | 39.68 | 18.89 | 67.48 | 2.63 |
| 883 | S | 70.50 | 1.27 | 93.45 | 4.54 | 34.88 | 2.35 | 48.31 | 60.32 | | | |
| 884 | 2.20 F | 301.50 | 19.03 | 67.88 | 2.00 | 95.87 | 98.83 | 96.47 | 57.62 | 18.46 | 67.45 | 3.33 |
| 885 | S | 13.00 | 5.24 | 57.59 | 34.12 | 4.13 | 1.17 | 3.53 | 42.38 | | | |

Heavy Media Lab Work

SCSQ/S Plus Mill Feed (Scrubbed)
-4 +5 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | NaCl | W.I. | Calculated Head Grade K2O | NaCl | W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 886 | 1.99 F | 21.30 | 61.89 | 1.05 | 0.38 | 12.11 | 41.52 | 0.18 | 1.85 | 18.05 | 68.87 | 2.49 |
| 887 | S | 154.60 | 12.01 | 78.21 | 2.78 | 87.89 | 58.48 | 99.82 | 98.15 | | | |
| 888 | 2.01 F | 25.20 | 60.12 | 2.64 | 0.66 | 16.40 | 54.28 | 0.63 | 4.53 | 18.16 | 68.61 | 2.39 |
| 889 | S | 128.50 | 9.93 | 81.55 | 2.73 | 83.60 | 45.72 | 99.37 | 95.47 | | | |
| 890 | 2.03 F | 29.70 | 56.95 | 5.74 | 0.77 | 19.05 | 61.33 | 1.59 | 5.70 | 17.69 | 68.78 | 2.58 |
| 891 | S | 126.20 | 8.45 | 83.62 | 3.00 | 80.95 | 38.67 | 98.41 | 94.30 | | | |
| 892 | 2.05 F | 39.40 | 56.63 | 9.64 | 0.72 | 25.27 | 72.35 | 3.68 | 7.42 | 19.78 | 66.23 | 2.45 |
| 893 | S | 116.50 | 7.32 | 85.37 | 3.04 | 74.73 | 27.65 | 96.32 | 92.58 | | | |
| 894 | 2.07 F | 47.30 | 54.04 | 13.34 | 1.12 | 29.09 | 80.71 | 5.81 | 13.44 | 19.48 | 66.74 | 2.42 |
| 895 | S | 115.30 | 5.30 | 88.65 | 2.96 | 70.91 | 19.29 | 94.19 | 86.56 | | | |
| 896 | 2.10 F | 59.20 | 47.17 | 24.15 | 1.19 | 35.90 | 88.87 | 12.88 | 17.02 | 19.06 | 67.33 | 2.51 |
| 897 | S | 105.70 | 3.31 | 91.51 | 3.25 | 64.10 | 11.13 | 87.12 | 82.98 | | | |
| 898 | 2.15 F | 111.00 | 30.21 | 50.82 | 1.36 | 60.99 | 97.78 | 45.62 | 37.07 | 18.84 | 67.94 | 2.24 |
| 899 | S | 71.00 | 1.07 | 94.70 | 3.61 | 39.01 | 2.22 | 54.38 | 62.93 | | | |
| 900 | 2.20 F | 273.60 | 19.47 | 67.33 | 1.85 | 96.10 | 98.84 | 96.72 | 56.66 | 18.93 | 66.90 | 3.14 |
| 901 | S | 11.10 | 5.63 | 56.21 | 34.88 | 3.90 | 1.16 | 3.28 | 43.34 | | | |

Heavy Media Lab Work

SCSQ/S Plus Mill Feed (Scrubbed)
-5 +6 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % M.I. | wt % | Distributions K2O | Distributions NaCl | Distributions M.I. | Calculated Head Grade K2O | Calculated Head Grade NaCl | Calculated Head Grade M.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 902 | 1.99 F | 26.40 | 62.10 | 0.87 | 0.33 | 15.39 | 47.76 | 0.20 | 2.23 | 20.02 | 65.97 | 2.28 |
| 903 | S | 145.10 | 12.36 | 77.81 | 2.63 | 84.61 | 52.24 | 99.80 | 97.77 | | | |
| 904 | 2.01 F | 37.30 | 60.13 | 2.66 | 0.61 | 21.70 | 63.54 | 0.89 | 5.58 | 20.53 | 64.79 | 2.37 |
| 905 | S | 134.60 | 9.56 | 82.01 | 2.86 | 78.30 | 36.46 | 99.11 | 94.42 | | | |
| 906 | 2.03 F | 43.00 | 60.32 | 3.96 | 0.56 | 23.38 | 71.00 | 1.39 | 6.06 | 19.87 | 66.40 | 2.16 |
| 907 | S | 140.90 | 7.52 | 85.45 | 2.65 | 76.62 | 29.00 | 98.61 | 93.94 | | | |
| 908 | 2.05 F | 49.70 | 57.53 | 8.18 | 0.76 | 28.85 | 79.84 | 3.62 | 11.01 | 20.79 | 65.11 | 1.99 |
| 909 | S | 122.60 | 5.89 | 88.19 | 2.49 | 71.15 | 20.16 | 96.38 | 88.99 | | | |
| 910 | 2.07 F | 58.40 | 55.64 | 10.95 | 0.98 | 30.88 | 83.48 | 5.20 | 12.93 | 20.58 | 65.08 | 2.34 |
| 911 | S | 130.70 | 4.92 | 89.26 | 2.95 | 69.12 | 16.52 | 94.80 | 87.07 | | | |
| 912 | 2.10 F | 71.00 | 50.66 | 18.51 | 1.30 | 39.20 | 92.11 | 11.44 | 20.71 | 21.56 | 63.41 | 2.46 |
| 913 | S | 110.10 | 2.80 | 92.36 | 3.21 | 60.80 | 7.89 | 88.56 | 79.29 | | | |
| 914 | 2.15 F | 124.30 | 34.12 | 44.75 | 1.24 | 60.19 | 98.30 | 41.66 | 32.92 | 20.89 | 64.66 | 2.27 |
| 915 | S | 82.20 | 0.89 | 94.77 | 3.82 | 39.81 | 1.70 | 58.34 | 67.08 | | | |
| 916 | 2.20 F | 281.70 | 22.09 | 63.36 | 1.67 | 95.49 | 98.82 | 95.67 | 53.75 | 21.35 | 63.24 | 2.97 |
| 917 | S | 13.30 | 5.59 | 60.71 | 30.44 | 4.51 | 1.18 | 4.33 | 46.25 | | | |

Heavy Media Lab Work

SCSQ/S Plus Mill Feed (Scrubbed)
-6 +8 Mesh

| | | | | | | | Distributions | | | Calculated Head Grade | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | K2O | NaCl | W.I. | K2O | NaCl | W.I. |
| 918 | 1.99 F | 43.50 | 62.38 | 1.06 | 0.20 | 21.95 | 60.57 | 0.37 | 2.17 | 22.60 | 62.21 | 2.00 |
| 919 | S | 154.70 | 11.42 | 79.41 | 2.51 | 78.05 | 39.43 | 99.63 | 97.81 | | | |
| 920 | 2.01 F | 47.80 | 61.73 | 1.79 | 0.50 | 26.08 | 72.21 | 0.75 | 6.03 | 22.29 | 62.55 | 2.16 |
| 921 | S | 135.50 | 8.38 | 83.99 | 2.75 | 73.92 | 27.79 | 99.25 | 93.97 | | | |
| 922 | 2.03 F | 53.00 | 60.72 | 3.33 | 0.56 | 29.43 | 79.62 | 1.57 | 7.93 | 22.44 | 62.40 | 2.08 |
| 923 | S | 127.10 | 6.48 | 87.03 | 2.71 | 70.57 | 20.38 | 98.43 | 92.07 | | | |
| 924 | 2.05 F | 57.60 | 58.86 | 6.12 | 0.71 | 32.40 | 86.27 | 3.14 | 12.02 | 22.10 | 63.10 | 1.91 |
| 925 | S | 120.20 | 4.49 | 90.40 | 2.49 | 67.60 | 13.73 | 96.86 | 87.98 | | | |
| 926 | 2.07 F | 61.30 | 57.69 | 7.82 | 0.87 | 35.87 | 90.77 | 4.53 | 15.37 | 22.80 | 61.89 | 2.03 |
| 927 | S | 109.60 | 3.28 | 92.13 | 2.68 | 64.13 | 9.23 | 95.47 | 84.63 | | | |
| 928 | 2.10 F | 67.30 | 53.47 | 14.20 | 1.16 | 40.44 | 94.14 | 9.34 | 21.66 | 22.97 | 61.47 | 2.17 |
| 929 | S | 99.10 | 2.26 | 93.57 | 2.85 | 59.56 | 5.86 | 90.66 | 78.34 | | | |
| 930 | 2.15 F | 122.60 | 39.30 | 36.65 | 1.14 | 60.07 | 98.52 | 36.74 | 31.91 | 23.96 | 59.92 | 2.15 |
| 931 | S | 81.50 | 0.89 | 94.93 | 3.66 | 39.93 | 1.48 | 63.26 | 68.09 | | | |
| 932 | 2.20 F | 287.20 | 22.78 | 62.31 | 1.63 | 95.80 | 99.17 | 95.64 | 56.78 | 22.01 | 62.42 | 2.75 |
| 933 | S | 12.60 | 4.36 | 64.82 | 28.28 | 4.20 | 0.83 | 4.36 | 43.22 | | | |

Heavy Media Lab Work

SCSQ/S Plus Mill Feed (Scrubbed)
-8 +10 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | Distributions NaCl | Distributions W.I. | Calculated Head Grade K2O | Calculated Head Grade NaCl | Calculated Head Grade W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 934 | 1.99 F | 51.60 | 61.78 | 1.83 | 0.38 | 27.49 | 69.52 | 0.85 | 4.72 | 24.43 | 59.11 | 2.21 |
| 935 | S | 136.10 | 10.27 | 80.83 | 2.91 | 72.51 | 30.48 | 99.15 | 95.28 | | | |
| 936 | 2.01 F | 52.80 | 62.04 | 1.24 | 0.56 | 32.43 | 82.72 | 0.68 | 8.59 | 24.32 | 59.38 | 2.11 |
| 937 | S | 110.00 | 6.22 | 87.29 | 2.86 | 67.57 | 17.28 | 99.32 | 91.41 | | | |
| 938 | 2.03 F | 56.20 | 60.92 | 2.92 | 0.65 | 36.80 | 87.58 | 1.87 | 12.38 | 25.60 | 57.55 | 1.93 |
| 939 | S | 96.50 | 5.03 | 89.36 | 2.68 | 63.20 | 12.42 | 98.13 | 87.62 | | | |
| 940 | 2.05 F | 60.00 | 60.49 | 3.42 | 0.83 | 39.06 | 91.59 | 2.34 | 16.31 | 25.80 | 57.18 | 1.99 |
| 941 | S | 93.60 | 3.56 | 91.64 | 2.73 | 60.94 | 8.41 | 97.66 | 83.69 | | | |
| 942 | 2.07 F | 64.70 | 59.26 | 5.31 | 0.89 | 40.39 | 93.98 | 3.71 | 18.65 | 25.47 | 57.76 | 1.93 |
| 943 | S | 95.50 | 2.57 | 93.30 | 2.63 | 59.61 | 6.02 | 96.29 | 81.35 | | | |
| 944 | 2.10 F | 68.20 | 57.11 | 8.62 | 0.98 | 42.65 | 96.28 | 6.34 | 20.95 | 25.30 | 57.96 | 2.00 |
| 945 | S | 91.70 | 1.64 | 94.65 | 2.75 | 57.35 | 3.72 | 93.66 | 79.05 | | | |
| 946 | 2.15 F | 113.20 | 43.16 | 30.70 | 0.98 | 59.55 | 99.06 | 32.02 | 31.62 | 25.94 | 57.09 | 1.85 |
| 947 | S | 76.90 | 0.60 | 95.93 | 3.12 | 40.45 | 0.94 | 67.98 | 68.38 | | | |
| 948 | 2.20 F | 304.50 | 24.86 | 59.28 | 1.37 | 96.09 | 99.31 | 95.91 | 51.88 | 24.05 | 59.39 | 2.54 |
| 949 | S | 12.40 | 4.22 | 62.12 | 31.20 | 3.91 | 0.69 | 4.09 | 48.12 | | | |

Heavy Media Lab Work

SCSQ/S Plus Mill Feed (Scrubbed)
-10 +14 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | Distributions NaCl | Distributions W.I. | Calculated Head Grade K2O | Calculated Head Grade NaCl | Calculated Head Grade W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 950 | 1.99 F | 61.70 | 62.31 | 0.89 | 0.48 | 31.37 | 75.30 | 0.49 | 7.06 | 25.96 | 56.78 | 2.13 |
| 951 | S | 135.00 | 9.34 | 82.33 | 2.89 | 68.63 | 24.70 | 99.51 | 92.94 | | | |
| 952 | 2.01 F | 58.20 | 61.96 | 1.44 | 0.49 | 35.68 | 87.30 | 0.89 | 9.27 | 25.33 | 58.03 | 1.89 |
| 953 | S | 104.90 | 5.00 | 89.43 | 2.66 | 64.32 | 12.70 | 99.11 | 90.73 | | | |
| 954 | 2.03 F | 60.60 | 61.45 | 2.11 | 0.62 | 39.63 | 91.64 | 1.49 | 13.81 | 26.58 | 56.16 | 1.78 |
| 955 | S | 92.30 | 3.68 | 91.64 | 2.54 | 60.37 | 8.36 | 98.51 | 86.19 | | | |
| 956 | 2.05 F | 56.00 | 60.83 | 2.88 | 0.83 | 40.79 | 94.60 | 2.07 | 19.37 | 26.23 | 56.74 | 1.75 |
| 957 | S | 81.30 | 2.39 | 93.84 | 2.38 | 59.21 | 5.40 | 97.93 | 80.63 | | | |
| 958 | 2.07 F | 57.90 | 60.37 | 3.64 | 0.80 | 43.24 | 95.67 | 2.86 | 20.12 | 27.29 | 55.09 | 1.72 |
| 959 | S | 76.00 | 2.08 | 94.29 | 2.42 | 56.76 | 4.33 | 97.14 | 79.88 | | | |
| 960 | 2.10 F | 62.20 | 58.72 | 6.24 | 0.81 | 43.77 | 97.55 | 4.82 | 21.30 | 26.35 | 56.63 | 1.66 |
| 961 | S | 79.90 | 1.15 | 95.85 | 2.33 | 56.23 | 2.45 | 95.18 | 78.70 | | | |
| 962 | 2.15 F | 95.00 | 43.36 | 30.56 | 0.81 | 63.42 | 99.25 | 35.58 | 30.50 | 27.71 | 54.46 | 1.68 |
| 963 | S | 54.80 | 0.57 | 95.90 | 3.20 | 36.58 | 0.75 | 64.42 | 69.50 | | | |
| 964 | 2.20 F | 315.50 | 28.91 | 53.02 | 1.22 | 96.31 | 99.47 | 95.67 | 50.52 | 27.99 | 53.37 | 2.33 |
| 965 | S | 12.10 | 4.00 | 62.51 | 31.16 | 3.69 | 0.53 | 4.33 | 49.48 | | | |

Heavy Media Lab Work

SCSQ/S Plus Mill Feed (Scrubbed)
-14 +20 Mesh

| Sample # | SG | wt. | % K20 | % NaCl | % W.I. | wt % | Distributions K20 | Distributions NaCl | Distributions W.I. | Calculated Head Grade K20 | Calculated Head Grade NaCl | Calculated Head Grade W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 966 | 1.99 F | 43.80 | 62.37 | 0.84 | 0.44 | 33.61 | 78.48 | 0.51 | 6.73 | 26.71 | 55.51 | 2.20 |
| 967 | S | 86.50 | 8.66 | 83.20 | 3.09 | 66.39 | 21.52 | 99.49 | 93.27 | | | |
| 968 | 2.01 F | 46.90 | 60.84 | 3.12 | 0.58 | 39.31 | 90.00 | 2.19 | 11.33 | 26.58 | 55.92 | 2.01 |
| 969 | S | 72.40 | 4.38 | 90.13 | 2.94 | 60.69 | 10.00 | 97.81 | 88.67 | | | |
| 970 | 2.03 F | 51.20 | 60.69 | 3.43 | 0.51 | 40.70 | 92.39 | 2.49 | 13.31 | 26.73 | 56.12 | 1.56 |
| 971 | S | 74.60 | 3.43 | 92.29 | 2.28 | 59.30 | 7.61 | 97.51 | 86.69 | | | |
| 972 | 2.05 F | 58.90 | 60.45 | 3.67 | 0.65 | 44.02 | 95.65 | 2.98 | 16.48 | 27.82 | 54.23 | 1.74 |
| 973 | S | 74.90 | 2.16 | 93.99 | 2.59 | 55.98 | 4.35 | 97.02 | 83.52 | | | |
| 974 | 2.07 F | 57.00 | 60.57 | 3.44 | 0.69 | 44.02 | 96.79 | 2.77 | 17.60 | 27.54 | 54.68 | 1.73 |
| 975 | S | 72.50 | 1.58 | 94.96 | 2.54 | 55.98 | 3.21 | 97.23 | 82.40 | | | |
| 976 | 2.10 F | 49.80 | 59.43 | 5.22 | 0.71 | 46.59 | 98.18 | 4.52 | 20.37 | 28.20 | 53.74 | 1.62 |
| 977 | S | 57.10 | 0.96 | 96.06 | 2.42 | 53.41 | 1.82 | 95.48 | 79.63 | | | |
| 978 | 2.15 F | 87.80 | 42.39 | 32.18 | 0.72 | 64.99 | 99.38 | 38.33 | 30.06 | 27.72 | 54.56 | 1.56 |
| 979 | S | 47.30 | 0.49 | 96.11 | 3.11 | 35.01 | 0.62 | 61.67 | 69.94 | | | |
| 980 | 2.20 F | 314.90 | 28.49 | 53.70 | 1.20 | 96.60 | 99.51 | 96.10 | 51.61 | 27.66 | 53.97 | 2.25 |
| 981 | S | 11.10 | 4.00 | 61.75 | 31.92 | 3.40 | 0.49 | 3.90 | 48.39 | | | |

Heavy Media Lab Work

Sec. Insol Tails
+6 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | NaCl | W.I. | Calculated Head Grade K2O | NaCl | W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 696 | 1.99 F | 17.90 | 61.89 | 1.79 | 0.25 | 16.57 | 51.01 | 0.44 | 2.79 | 20.11 | 66.69 | 1.48 |
| 697 | S | 90.10 | 11.81 | 79.58 | 1.73 | 83.43 | 48.99 | 99.56 | 97.21 | | | |
| 698 | 2.03 F | 21.70 | 59.01 | 5.96 | 0.64 | 22.30 | 70.00 | 1.93 | 9.96 | 18.80 | 68.81 | 1.43 |
| 699 | S | 75.60 | 7.26 | 86.85 | 1.66 | 77.70 | 30.00 | 98.07 | 90.04 | | | |
| 700 | 2.07 F | 32.40 | 55.27 | 11.61 | 0.91 | 30.14 | 82.35 | 5.27 | 17.43 | 20.23 | 66.41 | 1.57 |
| 701 | S | 75.10 | 5.11 | 90.05 | 1.86 | 69.86 | 17.65 | 94.73 | 82.57 | | | |
| 702 | 2.15 F | 83.50 | 33.82 | 45.37 | 1.10 | 62.69 | 98.58 | 44.13 | 45.21 | 21.51 | 64.44 | 1.53 |
| 703 | S | 49.70 | 0.82 | 96.49 | 2.24 | 37.31 | 1.42 | 55.87 | 54.79 | | | |

Heavy Media Lab Work

Sec Insol Tails
-6 + 8 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | NaCl | W.I. | Calculated Head Grade K2O | NaCl | W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 715 | 1.99 F | 36.90 | 61.55 | 2.30 | 0.28 | 22.96 | 66.60 | 0.81 | 4.43 | 21.22 | 64.96 | 1.45 |
| 716 | S | 123.80 | 9.20 | 83.64 | 1.80 | 77.04 | 33.40 | 99.19 | 95.57 | | | |
| 717 | 2.01 F | 40.50 | 61.52 | 2.16 | 0.46 | 27.97 | 79.34 | 0.94 | 9.31 | 21.69 | 64.29 | 1.38 |
| 718 | S | 104.30 | 6.22 | 88.41 | 1.74 | 72.03 | 20.66 | 99.06 | 90.69 | | | |
| 719 | 2.03 F | 47.80 | 60.26 | 4.03 | 0.59 | 30.70 | 79.51 | 2.00 | 12.99 | 23.27 | 61.78 | 1.39 |
| 720 | S | 107.90 | 6.88 | 87.34 | 1.75 | 69.30 | 20.49 | 98.00 | 87.01 | | | |
| 721 | 2.05 F | 45.60 | 59.35 | 5.23 | 0.83 | 31.40 | 86.01 | 2.56 | 17.51 | 21.67 | 64.21 | 1.49 |
| 722 | S | 99.60 | 4.42 | 91.21 | 1.79 | 68.60 | 13.99 | 97.44 | 82.49 | | | |
| 723 | 2.07 F | 48.10 | 57.70 | 7.78 | 0.89 | 34.23 | 88.72 | 4.21 | 20.84 | 22.27 | 63.29 | 1.46 |
| 724 | S | 92.40 | 3.82 | 92.19 | 1.76 | 65.77 | 11.28 | 95.79 | 79.16 | | | |
| 725 | 2.10 F | 57.60 | 54.35 | 13.05 | 0.92 | 37.52 | 93.66 | 7.63 | 25.20 | 21.78 | 64.16 | 1.37 |
| 726 | S | 95.90 | 2.21 | 94.86 | 1.64 | 62.48 | 6.34 | 92.37 | 74.80 | | | |
| 727 | 2.15 F | 108.90 | 39.61 | 36.12 | 1.18 | 58.67 | 98.84 | 34.63 | 43.68 | 23.51 | 61.20 | 1.58 |
| 728 | S | 76.70 | 0.66 | 96.80 | 2.16 | 41.33 | 1.16 | 65.37 | 56.32 | | | |
| 729 | 2.20 F | 303.40 | 22.02 | 63.85 | 1.30 | 97.59 | 99.62 | 97.23 | 71.35 | 21.57 | 64.08 | 1.78 |
| 730 | S | 7.50 | 3.38 | 73.53 | 21.12 | 2.41 | 0.38 | 2.77 | 28.65 | | | |

Heavy Media Lab Work

Sec Insol Tails
-8 + 10 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | NaCl | W.I. | Calculated Head Grade K2O | NaCl | W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 731 | 1.99 F | 46.80 | 61.96 | 1.57 | 0.36 | 26.96 | 70.45 | 0.69 | 7.54 | 23.71 | 61.19 | 1.29 |
| 732 | S | 126.80 | 9.59 | 83.19 | 1.63 | 73.04 | 29.55 | 99.31 | 92.46 | | | |
| 733 | 2.01 F | 50.30 | 61.64 | 1.91 | 0.52 | 32.45 | 84.34 | 1.01 | 13.43 | 23.72 | 61.20 | 1.26 |
| 734 | S | 104.70 | 5.50 | 89.68 | 1.61 | 67.55 | 15.66 | 98.99 | 86.57 | | | |
| 735 | 2.03 F | 47.80 | 60.80 | 3.11 | 0.65 | 33.85 | 87.73 | 1.71 | 17.21 | 23.46 | 61.58 | 1.28 |
| 736 | S | 93.40 | 4.35 | 91.51 | 1.60 | 66.15 | 12.27 | 98.29 | 82.79 | | | |
| 737 | 2.05 F | 55.70 | 60.48 | 3.65 | 0.62 | 36.89 | 90.78 | 2.25 | 17.83 | 24.58 | 59.82 | 1.28 |
| 738 | S | 95.30 | 3.59 | 92.65 | 1.67 | 63.11 | 9.22 | 97.75 | 82.17 | | | |
| 739 | 2.07 F | 54.00 | 58.30 | 7.01 | 0.71 | 38.27 | 93.05 | 4.42 | 20.01 | 23.98 | 60.69 | 1.36 |
| 740 | S | 87.10 | 2.70 | 93.97 | 1.76 | 61.73 | 6.95 | 95.58 | 79.99 | | | |
| 741 | 2.10 F | 70.30 | 57.08 | 8.79 | 0.86 | 41.92 | 95.77 | 6.24 | 26.07 | 24.99 | 59.07 | 1.38 |
| 742 | S | 97.40 | 1.82 | 95.36 | 1.76 | 58.08 | 4.23 | 93.76 | 73.93 | | | |
| 743 | 2.15 F | 112.70 | 45.38 | 27.36 | 0.81 | 54.47 | 98.89 | 25.22 | 33.08 | 25.00 | 59.10 | 1.33 |
| 744 | S | 94.20 | 0.61 | 97.07 | 1.96 | 45.53 | 1.11 | 74.78 | 66.92 | | | |
| 745 | 2.20 F | 294.60 | 26.97 | 56.15 | 1.16 | 97.81 | 99.71 | 97.14 | 71.52 | 26.46 | 56.54 | 1.59 |
| 746 | S | 6.60 | 3.47 | 73.89 | 20.62 | 2.19 | 0.29 | 2.86 | 28.48 | | | |

Heavy Media Lab Work

Sec Insol Tails
-10 +14 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | | wt % | Distributions K2O | NaCl | W.I. | | Calculated Head Grade K2O | NaCl | W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 747 | 1.99 F | 57.60 | 62.12 | 1.31 | 0.36 | | 31.74 | 76.79 | 0.72 | 8.91 | | 25.67 | 58.08 | 1.28 |
| 748 | S | 123.90 | 8.73 | 84.47 | 1.71 | | 68.26 | 23.21 | 99.28 | 91.09 | | | | |
| 749 | 2.01 F | 66.20 | 61.69 | 1.89 | 0.46 | | 37.81 | 88.61 | 1.25 | 14.27 | | 26.32 | 57.12 | 1.22 |
| 750 | S | 108.90 | 4.82 | 90.69 | 1.68 | | 62.19 | 11.39 | 98.75 | 85.73 | | | | |
| 751 | 2.03 F | 60.70 | 61.07 | 2.80 | 0.54 | | 38.37 | 91.53 | 1.84 | 16.67 | | 25.60 | 58.24 | 1.24 |
| 752 | S | 97.50 | 3.52 | 92.75 | 1.68 | | 61.63 | 8.47 | 98.16 | 83.33 | | | | |
| 753 | 2.05 F | 66.00 | 60.65 | 3.31 | 0.69 | | 40.77 | 93.76 | 2.37 | 22.67 | | 26.37 | 57.02 | 1.24 |
| 754 | S | 95.90 | 2.78 | 93.98 | 1.62 | | 59.23 | 6.24 | 97.63 | 77.33 | | | | |
| 755 | 2.07 F | 65.80 | 60.14 | 4.06 | 0.75 | | 41.23 | 95.26 | 2.91 | 25.46 | | 26.03 | 57.59 | 1.21 |
| 756 | S | 93.80 | 2.10 | 95.14 | 1.54 | | 58.77 | 4.74 | 97.09 | 74.54 | | | | |
| 757 | 2.10 F | 70.90 | 58.77 | 6.26 | 0.72 | | 41.68 | 97.04 | 4.43 | 24.80 | | 25.24 | 58.83 | 1.21 |
| 758 | S | 99.20 | 1.28 | 96.41 | 1.56 | | 58.32 | 2.96 | 95.57 | 75.20 | | | | |
| 759 | 2.15 F | 117.40 | 47.08 | 24.68 | 0.80 | | 57.49 | 99.10 | 25.55 | 37.16 | | 27.31 | 55.53 | 1.24 |
| 760 | S | 86.80 | 0.58 | 97.25 | 1.83 | | 42.51 | 0.90 | 74.45 | 62.84 | | | | |
| 761 | 2.20 F | 297.80 | 26.80 | 56.48 | 1.10 | | 98.12 | 99.78 | 97.60 | 71.80 | | 26.35 | 56.78 | 1.50 |
| 762 | S | 5.70 | 3.04 | 72.62 | 22.57 | | 1.88 | 0.22 | 2.40 | 28.20 | | | | |

Heavy Media Lab Work

Sec. Insol Tails
-14 +20 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | Distributions NaCl | Distributions W.I. | Calculated Head Grade K2O | Calculated Head Grade NaCl | Calculated Head Grade W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 763 | 1.99 F | 70.50 | 61.76 | 1.76 | 0.48 | 37.82 | 83.73 | 1.22 | 14.51 | 27.90 | 54.59 | 1.25 |
| 764 | S | 115.90 | 7.30 | 86.73 | 1.72 | 62.18 | 16.27 | 98.78 | 85.49 | | | |
| 765 | 2.01 F | 72.30 | 61.68 | 1.87 | 0.50 | 41.55 | 92.03 | 1.42 | 17.81 | 27.85 | 54.75 | 1.17 |
| 766 | S | 101.70 | 3.80 | 92.35 | 1.64 | 58.45 | 7.97 | 98.58 | 82.19 | | | |
| 767 | 2.03 F | 69.10 | 60.93 | 2.96 | 0.60 | 41.70 | 93.08 | 2.22 | 21.47 | 27.30 | 55.63 | 1.17 |
| 768 | S | 96.60 | 3.24 | 93.30 | 1.57 | 58.30 | 6.92 | 97.78 | 78.53 | | | |
| 769 | 2.05 F | 70.30 | 60.72 | 3.18 | 0.71 | 42.81 | 95.20 | 2.45 | 25.66 | 27.31 | 55.60 | 1.18 |
| 770 | S | 93.90 | 2.29 | 94.84 | 1.54 | 57.19 | 4.80 | 97.55 | 74.34 | | | |
| 771 | 2.07 F | 77.10 | 60.56 | 3.39 | 0.75 | 45.09 | 96.28 | 2.83 | 29.52 | 28.36 | 53.96 | 1.15 |
| 772 | S | 93.90 | 1.92 | 95.49 | 1.47 | 54.91 | 3.72 | 97.17 | 70.48 | | | |
| 773 | 2.10 F | 78.00 | 59.07 | 5.75 | 0.75 | 46.85 | 97.49 | 4.99 | 31.46 | 28.38 | 53.95 | 1.12 |
| 774 | S | 88.50 | 1.34 | 96.44 | 1.44 | 53.15 | 2.51 | 95.01 | 68.54 | | | |
| 775 | 2.15 F | 135.60 | 42.85 | 31.48 | 0.69 | 67.00 | 99.10 | 39.79 | 40.59 | 28.97 | 53.01 | 1.14 |
| 776 | S | 66.80 | 0.79 | 96.70 | 2.05 | 33.00 | 0.90 | 60.21 | 59.41 | | | |
| 777 | 2.20 F | 306.70 | 27.48 | 55.40 | 1.10 | 98.52 | 99.82 | 98.14 | 74.73 | 27.12 | 55.61 | 1.45 |
| 778 | S | 4.60 | 3.37 | 69.87 | 24.80 | 1.48 | 0.18 | 1.86 | 25.27 | | | |

Heavy Media Lab Work

Rougher Tails
+6 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | Distributions NaCl | Distributions W.I. | Calculated Head Grade K2O | Calculated Head Grade NaCl | Calculated Head Grade W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 779 | 1.99 F | 25.70 | 61.97 | 1.67 | 0.24 | 13.80 | 44.43 | 0.34 | 2.71 | 19.25 | 68.31 | 1.22 |
| 780 | S | 160.50 | 12.41 | 78.98 | 1.38 | 86.20 | 55.57 | 99.66 | 97.29 | | | |
| 781 | 2.03 F | 36.20 | 59.70 | 4.81 | 0.69 | 23.35 | 70.75 | 1.66 | 12.08 | 19.71 | 67.48 | 1.33 |
| 782 | S | 118.80 | 7.52 | 86.57 | 1.53 | 76.65 | 29.25 | 98.34 | 87.92 | | | |
| 783 | 2.07 F | 47.60 | 54.81 | 12.46 | 0.78 | 30.18 | 84.13 | 5.57 | 17.68 | 19.66 | 67.54 | 1.33 |
| 784 | S | 110.10 | 4.47 | 91.35 | 1.57 | 69.82 | 15.87 | 94.43 | 82.32 | | | |
| 785 | 2.15 F | 106.20 | 30.77 | 50.41 | 0.89 | 64.72 | 98.93 | 48.78 | 45.82 | 20.13 | 66.88 | 1.26 |
| 786 | S | 57.90 | 0.61 | 97.10 | 1.93 | 35.28 | 1.07 | 51.22 | 54.18 | | | |

Heavy Media Lab Work

Rougher Tails
-6 +8 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | Distributions NaCl | Distributions W.I. | Calculated Head Grade K2O | Calculated Head Grade NaCl | Calculated Head Grade W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 787 | 1.99 F | 23.20 | 61.98 | 1.67 | 0.22 | 11.56 | 45.87 | 0.26 | 1.83 | 15.62 | 73.89 | 1.39 |
| 788 | S | 177.50 | 9.56 | 83.33 | 1.54 | 88.44 | 54.13 | 99.74 | 98.17 | | | |
| 789 | 2.01 F | 35.90 | 61.15 | 2.68 | 0.53 | 18.01 | 64.73 | 0.67 | 6.67 | 17.02 | 71.63 | 1.43 |
| 790 | S | 163.40 | 7.32 | 86.78 | 1.63 | 81.99 | 35.27 | 99.33 | 93.33 | | | |
| 791 | 2.03 F | 33.00 | 59.65 | 4.91 | 0.67 | 18.26 | 69.35 | 1.22 | 8.46 | 15.71 | 73.69 | 1.45 |
| 792 | S | 147.70 | 5.89 | 89.06 | 1.62 | 81.74 | 30.65 | 98.78 | 91.54 | | | |
| 793 | 2.05 F | 36.40 | 57.46 | 8.23 | 0.82 | 20.13 | 77.19 | 2.21 | 11.83 | 14.99 | 74.89 | 1.40 |
| 794 | S | 144.40 | 4.28 | 91.69 | 1.54 | 79.87 | 22.81 | 97.79 | 88.17 | | | |
| 795 | 2.07 F | 36.10 | 54.71 | 12.52 | 0.88 | 21.16 | 83.04 | 3.46 | 14.35 | 13.94 | 76.63 | 1.30 |
| 796 | S | 134.50 | 3.00 | 93.84 | 1.41 | 78.84 | 16.96 | 96.54 | 85.65 | | | |
| 797 | 2.10 F | 54.10 | 49.74 | 20.19 | 1.08 | 31.99 | 91.55 | 9.09 | 24.22 | 17.38 | 71.06 | 1.43 |
| 798 | S | 115.00 | 2.16 | 94.99 | 1.59 | 68.01 | 8.45 | 90.91 | 75.78 | | | |
| 799 | 2.15 F | 106.60 | 31.82 | 48.71 | 0.92 | 55.58 | 98.74 | 38.52 | 37.36 | 17.91 | 70.28 | 1.37 |
| 800 | S | 85.20 | 0.51 | 97.26 | 1.93 | 44.42 | 1.26 | 61.48 | 62.64 | | | |
| 801 | 2.20 F | 356.00 | 14.91 | 75.44 | 0.96 | 97.83 | 99.70 | 97.75 | 69.93 | 14.63 | 75.50 | 1.34 |
| 802 | S | 7.90 | 2.03 | 78.19 | 18.60 | 2.17 | 0.30 | 2.25 | 30.07 | | | |

Heavy Media Lab Work

Rougher Tails
-8 +10 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | Distributions NaCl | Distributions W.I. | Calculated Head Grade K2O | Calculated Head Grade NaCl | Calculated Head Grade W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 803 | 1.99 F | 9.70 | 62.50 | 0.71 | 0.36 | 3.67 | 32.99 | 0.03 | 0.96 | 6.96 | 87.62 | 1.37 |
| 804 | S | 254.40 | 4.84 | 90.93 | 1.41 | 96.33 | 67.01 | 99.97 | 99.04 | | | |
| 805 | 2.01 F | 12.80 | 60.79 | 2.88 | 0.90 | 6.62 | 48.58 | 0.22 | 4.21 | 8.28 | 85.48 | 1.41 |
| 806 | S | 180.60 | 4.56 | 91.33 | 1.45 | 93.38 | 51.42 | 99.78 | 95.79 | | | |
| 807 | 2.03 F | 12.60 | 59.41 | 4.69 | 1.27 | 6.62 | 51.06 | 0.36 | 6.58 | 7.71 | 86.52 | 1.28 |
| 808 | S | 177.60 | 4.04 | 92.33 | 1.28 | 93.38 | 48.94 | 99.64 | 93.42 | | | |
| 809 | 2.05 F | 16.80 | 55.33 | 10.58 | 1.84 | 9.38 | 66.60 | 1.15 | 11.97 | 7.79 | 86.23 | 1.44 |
| 810 | S | 162.40 | 2.87 | 94.06 | 1.40 | 90.63 | 33.40 | 98.85 | 88.03 | | | |
| 811 | 2.07 F | 16.60 | 52.04 | 15.39 | 2.24 | 9.82 | 70.43 | 1.74 | 15.40 | 7.26 | 87.08 | 1.43 |
| 812 | S | 152.40 | 2.38 | 94.89 | 1.34 | 90.18 | 29.57 | 98.26 | 84.60 | | | |
| 813 | 2.10 F | 28.80 | 46.38 | 25.37 | 1.22 | 15.62 | 84.87 | 4.65 | 14.42 | 8.53 | 85.17 | 1.32 |
| 814 | S | 155.60 | 1.53 | 96.24 | 1.34 | 84.38 | 15.13 | 95.35 | 85.58 | | | |
| 815 | 2.15 F | 67.90 | 19.01 | 68.95 | 0.96 | 35.07 | 96.98 | 27.54 | 25.56 | 6.88 | 87.80 | 1.32 |
| 816 | S | 125.70 | 0.32 | 97.98 | 1.51 | 64.93 | 3.02 | 72.46 | 74.44 | | | |
| 817 | 2.20 F | 366.20 | 8.38 | 85.82 | 0.92 | 97.60 | 99.40 | 97.86 | 64.88 | 8.23 | 85.60 | 1.38 |
| 818 | S | 9.00 | 2.06 | 76.48 | 20.26 | 2.40 | 0.60 | 2.14 | 35.12 | | | |

Heavy Media Lab Work

Rougher Tails
-10 +14 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | Distributions NaCl | Distributions W.I. | Calculated Head Grade K2O | Calculated Head Grade NaCl | Calculated Head Grade W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 819 | 1.99 F | 2.70 | 61.69 | 1.87 | 0.48 | 0.97 | 20.63 | 0.02 | 0.38 | 2.89 | 94.19 | 1.23 |
| 820 | S | 276.20 | 2.32 | 95.09 | 1.24 | 99.03 | 79.37 | 99.98 | 99.62 | | | |
| 821 | 2.01 F | 3.90 | 60.55 | 3.15 | 1.00 | 1.80 | 36.47 | 0.06 | 1.47 | 2.98 | 94.06 | 1.23 |
| 822 | S | 213.10 | 1.93 | 95.72 | 1.23 | 98.20 | 63.53 | 99.94 | 98.53 | | | |
| 823 | 2.03 F | 3.30 | 58.77 | 5.56 | 1.40 | 1.61 | 33.25 | 0.09 | 1.81 | 2.84 | 94.26 | 1.24 |
| 824 | S | 201.70 | 1.93 | 95.71 | 1.24 | 98.39 | 66.75 | 99.91 | 98.19 | | | |
| 825 | 2.05 F | 4.50 | 55.88 | 9.64 | 1.90 | 2.65 | 46.55 | 0.27 | 3.92 | 3.19 | 93.67 | 1.29 |
| 826 | S | 165.00 | 1.75 | 95.96 | 1.27 | 97.35 | 53.45 | 99.73 | 96.08 | | | |
| 827 | 2.07 F | 7.00 | 50.95 | 17.04 | 2.30 | 3.62 | 52.35 | 0.66 | 6.41 | 3.52 | 93.14 | 1.30 |
| 828 | S | 186.60 | 1.74 | 95.99 | 1.26 | 96.38 | 47.65 | 99.34 | 93.59 | | | |
| 829 | 2.10 F | 7.80 | 37.23 | 39.76 | 1.30 | 4.36 | 63.65 | 1.83 | 5.03 | 2.55 | 94.83 | 1.13 |
| 830 | S | 171.00 | 0.97 | 97.34 | 1.12 | 95.64 | 36.35 | 98.17 | 94.97 | | | |
| 831 | 2.15 F | 47.80 | 11.12 | 81.63 | 0.77 | 23.94 | 92.59 | 20.74 | 14.75 | 2.87 | 94.20 | 1.25 |
| 832 | S | 151.90 | 0.28 | 98.16 | 1.40 | 76.06 | 7.41 | 79.26 | 85.25 | | | |
| 833 | 2.20 F | 373.50 | 3.04 | 94.26 | 0.93 | 97.57 | 97.98 | 98.04 | 64.83 | 3.03 | 93.81 | 1.40 |
| 834 | S | 9.30 | 2.52 | 75.75 | 20.26 | 2.43 | 2.02 | 1.96 | 35.17 | | | |

Heavy Media Lab Work

Rougher Tails
-14 +20 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | Distributions NaCl | Distributions W.I. | Calculated Head Grade K2O | Calculated Head Grade NaCl | Calculated Head Grade W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 835 | 1.99 F | 1.00 | 60.91 | 3.09 | 0.48 | 0.33 | 16.44 | 0.01 | 0.14 | 1.22 | 96.94 | 1.14 |
| 836 | S | 303.60 | 1.02 | 97.25 | 1.14 | 99.67 | 83.56 | 99.99 | 99.86 | | | |
| 837 | 2.01 F | 1.00 | 60.16 | 3.76 | 1.00 | 0.43 | 20.17 | 0.02 | 0.39 | 1.27 | 96.89 | 1.10 |
| 838 | S | 233.50 | 1.02 | 97.29 | 1.10 | 99.57 | 79.83 | 99.98 | 99.61 | | | |
| 839 | 2.03 F | 0.90 | 58.44 | 6.14 | 1.35 | 0.41 | 21.91 | 0.03 | 0.51 | 1.08 | 97.20 | 1.08 |
| 840 | S | 220.60 | 0.85 | 97.57 | 1.08 | 99.59 | 78.09 | 99.97 | 99.49 | | | |
| 841 | 2.05 F | 1.30 | 56.25 | 8.86 | 2.10 | 0.63 | 25.41 | 0.06 | 1.13 | 1.40 | 96.61 | 1.18 |
| 842 | S | 204.40 | 1.05 | 97.17 | 1.17 | 99.37 | 74.59 | 99.94 | 98.87 | | | |
| 843 | 2.07 F | 1.20 | 49.70 | 18.92 | 2.40 | 0.63 | 26.50 | 0.12 | 1.37 | 1.19 | 97.01 | 1.11 |
| 844 | S | 188.00 | 0.88 | 97.51 | 1.10 | 99.37 | 73.50 | 99.88 | 98.63 | | | |
| 845 | 2.10 F | 2.60 | 36.97 | 40.08 | 1.40 | 1.37 | 41.72 | 0.57 | 1.68 | 1.22 | 96.93 | 1.14 |
| 846 | S | 186.50 | 0.72 | 97.72 | 1.14 | 98.63 | 58.28 | 99.43 | 98.32 | | | |
| 847 | 2.15 F | 39.90 | 4.74 | 91.95 | 0.55 | 21.04 | 81.33 | 19.95 | 10.97 | 1.23 | 97.00 | 1.06 |
| 848 | S | 149.70 | 0.29 | 98.35 | 1.19 | 78.96 | 18.67 | 80.05 | 89.03 | | | |
| 849 | 2.20 F | 393.40 | 1.26 | 97.24 | 0.77 | 97.42 | 95.68 | 97.97 | 59.04 | 1.28 | 96.70 | 1.27 |
| 850 | S | 10.40 | 2.15 | 76.39 | 20.21 | 2.58 | 4.32 | 2.03 | 40.96 | | | |

Heavy Media Lab Work

Rougher Tails
-8 +10 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | Distributions NaCl | Distributions W.I. | Calculated Head Grade K2O | Calculated Head Grade NaCl | Calculated Head Grade W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 803 | 1.99 F | 9.70 | 62.50 | 0.71 | 0.36 | 3.67 | 32.99 | 0.03 | 0.96 | 6.96 | 87.62 | 1.37 |
| 804 | S | 254.40 | 4.84 | 90.93 | 1.41 | 96.33 | 67.01 | 99.97 | 99.04 | | | |
| 805 | 2.01 F | 12.80 | 60.79 | 2.88 | 0.90 | 6.62 | 48.58 | 0.22 | 4.21 | 8.28 | 85.48 | 1.41 |
| 806 | S | 180.60 | 4.56 | 91.33 | 1.45 | 93.38 | 51.42 | 99.78 | 95.79 | | | |
| 807 | 2.03 F | 12.60 | 59.41 | 4.69 | 1.27 | 6.62 | 51.06 | 0.36 | 6.58 | 7.71 | 86.52 | 1.28 |
| 808 | S | 177.60 | 4.04 | 92.33 | 1.28 | 93.38 | 48.94 | 99.64 | 93.42 | | | |
| 809 | 2.05 F | 16.80 | 55.33 | 10.58 | 1.84 | 9.38 | 66.60 | 1.15 | 11.97 | 7.79 | 86.23 | 1.44 |
| 810 | S | 162.40 | 2.87 | 94.06 | 1.40 | 90.63 | 33.40 | 98.85 | 88.03 | | | |
| 811 | 2.07 F | 16.60 | 52.04 | 15.39 | 2.24 | 9.82 | 70.43 | 1.74 | 15.40 | 7.26 | 87.08 | 1.43 |
| 812 | S | 152.40 | 2.38 | 94.89 | 1.34 | 90.18 | 29.57 | 98.26 | 84.60 | | | |
| 813 | 2.10 F | 28.80 | 46.38 | 25.37 | 1.22 | 15.62 | 84.87 | 4.65 | 14.42 | 8.53 | 85.17 | 1.32 |
| 814 | S | 155.60 | 1.53 | 96.24 | 1.34 | 84.38 | 15.13 | 95.35 | 85.58 | | | |
| 815 | 2.15 F | 67.90 | 19.01 | 68.95 | 0.96 | 35.07 | 96.98 | 27.54 | 25.56 | 6.88 | 87.80 | 1.32 |
| 816 | S | 125.70 | 0.32 | 97.98 | 1.51 | 64.93 | 3.02 | 72.46 | 74.44 | | | |
| 817 | 2.20 F | 366.20 | 8.38 | 85.82 | 0.92 | 97.60 | 99.40 | 97.86 | 64.88 | 8.23 | 85.60 | 1.38 |
| 818 | S | 9.00 | 2.06 | 76.48 | 20.26 | 2.40 | 0.60 | 2.14 | 35.12 | | | |

Heavy Media Lab Work

Rougher Tails
-10 +14 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | Distributions NaCl | Distributions W.I. | Calculated Head Grade K2O | Calculated Head Grade NaCl | Calculated Head Grade W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 819 | 1.99 F | 2.70 | 61.69 | 1.87 | 0.48 | 0.97 | 20.63 | 0.02 | 0.38 | 2.89 | 94.19 | 1.23 |
| 820 | S | 276.20 | 2.32 | 95.09 | 1.24 | 99.03 | 79.37 | 99.98 | 99.62 | | | |
| 821 | 2.01 F | 3.90 | 60.55 | 3.15 | 1.00 | 1.80 | 36.47 | 0.06 | 1.47 | 2.98 | 94.06 | 1.23 |
| 822 | S | 213.10 | 1.93 | 95.72 | 1.23 | 98.20 | 63.53 | 99.94 | 98.53 | | | |
| 823 | 2.03 F | 3.30 | 58.77 | 5.56 | 1.40 | 1.61 | 33.25 | 0.09 | 1.81 | 2.84 | 94.26 | 1.24 |
| 824 | S | 201.70 | 1.93 | 95.71 | 1.24 | 98.39 | 66.75 | 99.91 | 98.19 | | | |
| 825 | 2.05 F | 4.50 | 55.88 | 9.64 | 1.90 | 2.65 | 46.55 | 0.27 | 3.92 | 3.19 | 93.67 | 1.29 |
| 826 | S | 165.00 | 1.75 | 95.96 | 1.27 | 97.35 | 53.45 | 99.73 | 96.08 | | | |
| 827 | 2.07 F | 7.00 | 50.95 | 17.04 | 2.30 | 3.62 | 52.35 | 0.66 | 6.41 | 3.52 | 93.14 | 1.30 |
| 828 | S | 186.60 | 1.74 | 95.99 | 1.26 | 96.38 | 47.65 | 99.34 | 93.59 | | | |
| 829 | 2.10 F | 7.80 | 37.23 | 39.76 | 1.30 | 4.36 | 63.65 | 1.83 | 5.03 | 2.55 | 94.83 | 1.13 |
| 830 | S | 171.00 | 0.97 | 97.34 | 1.12 | 95.64 | 36.35 | 98.17 | 94.97 | | | |
| 831 | 2.15 F | 47.80 | 11.12 | 81.63 | 0.77 | 23.94 | 92.59 | 20.74 | 14.75 | 2.87 | 94.20 | 1.25 |
| 832 | S | 151.90 | 0.28 | 98.16 | 1.40 | 76.06 | 7.41 | 79.26 | 85.25 | | | |
| 833 | 2.20 F | 373.50 | 3.04 | 94.26 | 0.93 | 97.57 | 97.98 | 98.04 | 64.83 | 3.03 | 93.81 | 1.40 |
| 834 | S | 9.30 | 2.52 | 75.75 | 20.26 | 2.43 | 2.02 | 1.96 | 35.17 | | | |

Heavy Media Lab Work

Rougher Tails
-14 +20 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | Distributions NaCl | Distributions W.I. | Calculated Head Grade K2O | Calculated Head Grade NaCl | Calculated Head Grade W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 835 | 1.99 F | 1.00 | 60.91 | 3.09 | 0.48 | 0.33 | 16.44 | 0.01 | 0.14 | 1.22 | 96.94 | 1.14 |
| 836 | S | 303.60 | 1.02 | 97.25 | 1.14 | 99.67 | 83.56 | 99.99 | 99.86 | | | |
| 837 | 2.01 F | 1.00 | 60.16 | 3.76 | 1.00 | 0.43 | 20.17 | 0.02 | 0.39 | 1.27 | 96.89 | 1.10 |
| 838 | S | 233.50 | 1.02 | 97.29 | 1.10 | 99.57 | 79.83 | 99.98 | 99.61 | | | |
| 839 | 2.03 F | 0.90 | 58.44 | 6.14 | 1.35 | 0.41 | 21.91 | 0.03 | 0.51 | 1.08 | 97.20 | 1.08 |
| 840 | S | 220.60 | 0.85 | 97.57 | 1.08 | 99.59 | 78.09 | 99.97 | 99.49 | | | |
| 841 | 2.05 F | 1.30 | 56.25 | 8.86 | 2.10 | 0.63 | 25.41 | 0.06 | 1.13 | 1.40 | 96.61 | 1.18 |
| 842 | S | 204.40 | 1.05 | 97.17 | 1.17 | 99.37 | 74.59 | 99.94 | 98.87 | | | |
| 843 | 2.07 F | 1.20 | 49.70 | 18.92 | 2.40 | 0.63 | 26.50 | 0.12 | 1.37 | 1.19 | 97.01 | 1.11 |
| 844 | S | 188.00 | 0.88 | 97.51 | 1.10 | 99.37 | 73.50 | 99.88 | 98.63 | | | |
| 845 | 2.10 F | 2.60 | 36.97 | 40.08 | 1.40 | 1.37 | 41.72 | 0.57 | 1.68 | 1.22 | 96.93 | 1.14 |
| 846 | S | 186.50 | 0.72 | 97.72 | 1.14 | 98.63 | 58.28 | 99.43 | 98.32 | | | |
| 847 | 2.15 F | 39.90 | 4.74 | 91.95 | 0.55 | 21.04 | 81.33 | 19.95 | 10.97 | 1.23 | 97.00 | 1.06 |
| 848 | S | 149.70 | 0.29 | 98.35 | 1.19 | 78.96 | 18.67 | 80.05 | 89.03 | | | |
| 849 | 2.20 F | 393.40 | 1.26 | 97.24 | 0.77 | 97.42 | 95.68 | 97.97 | 59.04 | 1.28 | 96.70 | 1.27 |
| 850 | S | 10.40 | 2.15 | 76.39 | 20.21 | 2.58 | 4.32 | 2.03 | 40.96 | | | |

# APPENDIX B

PROGRESS REPORT #2

## A. HIGHLIGHT REPORT

## HEAVY MEDIA SEPARATION OF POTASH ORE

### 1.0 GENERAL

This report covers the second period of this project, which involved testing during the months of January, February and March 1987. Bench scale testing commenced at the Lakefield Research facility during the third week of January. Lakefield Research has a 150 mm diameter Tri-Flo separator installation with continuous media circulation but batch ore processing. The testing program was completed in less than a week, with a total of 17 sets of test runs being conducted. Each Tri-Flo test run produced a float product plus two sink products. These samples were brought back to the laboratory at Cominco Potash for chemical analysis and further evaluation in February.

In late February a photographic analysis of the samples commenced. These will be used to examine the locking characteristics of the middlings and tailings streams obtained from the Lakefield tests.

During March, photographic evaluation of the nature of the locking of KCl values of the middlings and tailings continued. A trip was also made to the two I.M.C.C. potash operations at Esterhazy, Saskatchewan to observe the operation of conventional hydroclone Heavy Media processing circuits.

### 2.0 SCHEDULE

The Lakefield testing was carried out very rapidly and without difficulty. The analytical and laboratory testing at the Cominco plant site is also proceeding on schedule. No obstacles or hindrances have been encountered so far.

2.1 Overall

| | |
|---|---|
| Control Schedule Completion | March 31, 1988 |
| Probable Completion | June 30, 1988 |

2.2 Milestones

| | |
|---|---|
| Lakefield Bench Scale Tri-Flo Testing Completion | January 23, 1987 |
| X-ray and Photographic Analysis Completion | March 28, 1987 |

### 3.0 COST SUMMARY

Expenditures for this period totaled $40,196.39. This brings the total project expenditure for this project to $52,116.39, as of the end of March 1987. The project funds are being expended as

**3.0 COST SUMMARY** - (Continued)

anticipated and within the deadlines of the project. The cost distribution is somewhat different from project plan as all the sample and product analysis is being carried out at the Cominco Potash Site. It was determined that Cominco's plant site laboratory was more capable than Lakefield of performing the analytical work at the necessary precision and accuracy. A substantial amount of processing was required on the samples prior to analyses as well. This has resulted in lower Lakefield Research costs, but increased labour costs on the part of Cominco Potash Laboratory and Development personnel.

The $40,195.76 sum represents 669 manhours of time, $9,365.64 related to Lakefield testing and expenses, and $4.070.75 for miscellaneous materials, supplies and shipping charges.

A "contract plan and report form" is included and represents the progress on the project this far.

| | | |
|---|---|---|
| 3.1 | Control Net Estimate | $65,113.00 |
| 3.2 | Expenditure this Period | $40,196.39 |
| 3.3 | Total Expenditure | $52,116.39 |
| 3.4 | Crown Portion 50/50 shared | $26,058.20 |

A claim for payment has been prepared and is included with the progress report sent to the Science Branch Contracting Officer.

**4.0 HIGHLIGHT**

Project progress has been within date and cost guidelines. No problems are anticipated in carrying out the remaining work.

The positive results obtained from the Lakefield test has resulted in recommendations dealing with sample analysis and further testing. These have or will be implimented either in this project during the final phase or in the pilot plant testing stage.

## B. PROJECT PROGRESS

### 1.0 INTRODUCTION

The following is the second progress report for the HMS project. It covers test work conducted in the period January - February 1987.

The test work is broken into three categories:

1) Further HMS laboratory evaluation at Cominco.
2) Semi continuous Tri-Flo HMS test work at Lakefield Research.
3) HMS Laboratory Evaluation of samples taken from the Lakefield test program.

### 2.0 SUMMARY AND CONCLUSIONS

2.1 The specific gravity of a particle results from the fraction (% of particle) and specific gravity of the particle components. The insoluble material has a much higher specific gravity than either KCl or NaCl. Because of this, the specific gravity of the nearly pure KCl particles is quite sensitive to small amounts of insoluble material (clays) associated with these KCl values and this insol material has an adverse effect on separation performance with respect to recovery.

2.2 In the Lakefield test work, the normal rougher feed material and the scrubbed feed material both give a much cleaner separation than the Dry Secondary Crushing Screen material, as 2.1 above suggests. The normal rougher feed gave the best results with a grade of 60% $K_2O$ achieved at 85% recovery while rejecting 95% of the NaCl and 80% of the insoluble material.

2.3 There does not appear to be an increase in separation efficiency with larger particle sizes, as theory would suggest.[1] This is likely because, at least in the particle size ranges used in this test work, separation performance is affected to a larger extent by the degree of component association than by the kinetic properties of the particles.

2.4 Though the results on the Dry Crushing Screen Feed material show a lower separation efficiency then the normal rougher feed material, the amount of on grade, +6 mesh material to the concentrate is significantly higher because of the higher percentage of +6 mesh material in the feed. Recover of the KCl particles at as large a size as possible has a dramatic effect on down stream processing costs and would likely offset the effects of a lower efficiency.

[1] Burt, Richard O. "Gravity Concentration Technology" Elsevier, 1984 pp 55

## 3.0 RECOMMENDATIONS

Based upon the results of test work completed to date, the following work is recommended.

3.1 Determination of particle locking characteristics in middling products. Bombardment of sylvinite ore with x-rays causes a temporary discoloration of the constituents as follows:

1) KCl - Purple

2) NaCl - Yellow

3) WI - no change

The particles can be photographed immediately after x-ray bombardment to provide a record of the locking phenomena observed.

From these photographs, the liberation characteristics of the middlings products can be established and the most effective means of subsequent middlings treatment determined.

3.2 Economic studies be conducted to determine:

1) Cost savings realized from installation of Tri-flo plant.

2) Operating benefits gained from a Tri-flo plant installation.

G.A. White/DMW
Vanscoy Office
April 6, 1987

## 4.0 DETAILS

### 4.1 Cominco HMS Lab Test Work

#### 4.1.1 Purpose:

Further work was conducted to observe any variations in separation performance between different ore samples. A second sample of Secondary Crushing Screen oversize plus Mill Feed material, exhibiting a higher insol content (after scrubbing) at relatively the same KCl assay, was obtained and subjected to the same separation procedure as the previous samples. These results are compared to the results obtained from the first Secondary Crushing Screen sample plus Mill Feed sample (Report 1 - Report SSC File - 14SQ.23440-6-9123).

#### 4.1.2 Procedure:

As outlined in Report 1.

#### 4.1.3 Data:

Results from both sets of HMS test work on Secondary Crushing Screen Oversize and Mill Feed material are in Appendix 1.

#### 4.1.4 Discussion of Results:

The following table summarizes data pertinent to the performance of the two Secondary Crushing Screens plus Mill Feed Sample Sets.

| | | SAMPLE SET | |
|---|---|---|---|
| | | First | Second |
| Daily Mill Feed Insol Avg. | (%) | 5.04 | 5.88 |
| Avg. Sample Insol | (%) | 2.36 | 1.94 |
| Avg. Sample $K_2O$ | (%) | 22.32 | 22.86 |
| $K_2O$ Recoveries to Concentrate (F) | | Lower | Higher |

In general, better recovery performance was observed in the second set of Secondary Crushing Screen plus Mill Feed samples. This can be attributed to the smaller amount of insoluble material reporting with the $K_2O$ values, resulting either from;

1) An actual difference in the degree of insol/KCl associations present in each of the ores.
2) A difference in scrubbing performance, the first samples being scrubbed to a lesser degree than the second samples.

In either case, it appears that the specific gravities of the particles in question are quite sensitive to small amounts of insoluble material associated with the KCl values and can have an adverse effect on separation performance.

## 4.2 Lakefield Test Work

### 4.2.1 Purpose:

A semi continuous Tri-Flo HMS test plant, located at Lakefield Research Centre, Lakefield, Ontario, was employed in this study. The purpose was to test the performance and efficiency, of the Tri-Flo separator in producing a KCl concentrate from other sylvinite ore components, namely NaCl and water insol material (clays) as contained in Saskatoon area potash ores.

Three different types of samples were tested in the Tri-Flo:

1) Dry Feed (Secondary Crushing Screen Feed).
2) Normal Rougher Feed.
3) Same material as 1) but scrubbed prior to testing.

A total of 17 tests were conducted at Lakefield, of which 8 were on the dry feed, 7 on the normal rougher feed and 2 on the scrubber Secondary Screen Feed material.

### 4.2.2 Procedure:

Sample Preparation

a) Dry Feed

The dry feed sample was obtained from the Secondary Crushing Screen feed in the concentrator crushing plant. This material was selected in order to obtain larger sized ore particles than is currently produced from the crushing plant but at a size that could be considered for processing in a full scale installation. A total of four 45 gallon drums were collected and screened at 24 mesh to remove the finer material.

b) Normal Rougher Feed

This sample was obtained from a stream feeding the flotation roughers. This particular stream was obtained after a point where the majority of the -35 mesh material had been removed. One barrel of this sample was collected.

c) Scrubbed and Screened Dry Feed

A portion (1-5 gallon container) of the material collected in 1) was scrubbed and screened in the Lab in order to produce a material having been processed to the same point as the normal rougher feed but containing larger than normal sized material for treatment.

Screen analyses for each of the samples are appended.

These samples, as well as two barrels of plant brine, where shipped to Lakefield for the test work.

4.2.3 Test Work, Data and Results:

Test work procedure, data and results, are outlined in the Lakefield Research Report "An Investigation of Heavy Media Separation of Potash Ore from Vanscoy". A copy of this report is included in Appendix 2. Cominco mass balances are included in Appendix 3.

4.3 Laboratory HMS Evaluation of Lakefield Testwork Samples

4.3.1 Purpose:

Further test work was conducted on the Lakefield Tri-Flo samples to determine the separation efficiency of the Tri-Flo unit on:

a) The whole sample.

b) The sample split into 3 size fractions: +6 mesh; -6 +10 mesh; -10 mesh.

From this work the following information could be derived:

a) Separation performance on the samples as a whole.

b) Separation performance on different sizes of material.

c) Tromp curves (characteristic separation efficiency curves).

d) Percentage of on grade material recovered to concentrate from each size fraction of material.

4.3.2 Procedure:

The samples from Lakefield tests #11 and 14 were used in this evaluation. These tests at Lakefield produced the best results in terms of recovery at or near an acceptable product grade (60% $K_2O$).

Each of the test products (F,S1,S2) was separated into specific gravity fractions, the 1.995 fraction being removed first, then the 2.015, etc. The particular specific gravity fraction was removed from the three samples using the same heavy liquid to ensure consistency.

These fractions were weighed and separated in to the three size fractions: +6 mesh, -6 +10 mesh, -10 mesh which were again weighed.

The amount of material from a particular specific gravity fraction was compared to the amount of the same specific gravity material in the other two products.

From these data, Tromp (partition) curves, efficiencies and recovery results were calculated.

4.3.3 Data:

The Lab calculated data are included in Appendix 4.

4.3.4 Discussion:

From the results the following points are evident.

a) As might be expected from the grade/recovery figures observed in the Lakefield test work results, the normal rougher feed material (Test #1) shows a sharper separation curve than does the Dry Secondary Crushing Screen Feed (Test #14). This is likely due to the larger degree of component association (locking) in the larger particle sizes of the Dry Crushing Screen Feed.

b) In Test #14, there does not appear to be a significant difference in the separation performance between the 3 size fractions considered. In Test #11, the efficiency increases in finer size fractions. These results are contrary to those predicted by theory and may point out that, in the particle size ranges used in this test work, the degree of component association has a much larger effect than do the kinetic properties of the particles on separation performance.

c) Though the results on the Dry Crushing Screen Feed material show a lower separation efficiency than the normal rougher feed material, the quantity of on grade +6 mesh material recovered to the concentrate is significantly higher because of the higher percentage of the +6 mesh material present in the Dry Feed.

## TABLE 1

## SCREEN ANALYSIS AND ASSAY

## DRY SECONDARY CRUSHING SCREEN FEED

| SIZE FRACTION | WT% | CUMM. WT. % | $K_2O$ | W.I. |
|---|---|---|---|---|
| -1/2 +1/4 " | 16.4 | 16.4 | 19.63 | 7.90 |
| -1/4 + 4 Mesh | 10.8 | 27.2 | 18.14 | 7.22 |
| - 4 + 5 | 5.8 | 33.0 | 18.55 | 6.54 |
| - 5 + 6 | 7.5 | 40.5 | 19.49 | 5.88 |
| - 6 + 8 | 16.4 | 56.9 | 22.01 | 5.18 |
| - 8 +10 | 15.5 | 72.4 | 24.07 | 4.44 |
| -10 +14 | 13.8 | 86.2 | 25.47 | 4.32 |
| -14 +20 | 13.6 | 99.8 | 26.49 | 4.34 |
| | | | 22.22 | 5.63 |

## TABLE 2

## SCREEN ANALYSIS AND ASSAY

## NORMAL ROUGHER FEED

| SIZE FRACTION | WT% | CUMM. WT. % | $K_2O$ | W.I. |
|---|---|---|---|---|
| + 6 | 7.8 | 7.8 | 21.66 | 1.05 |
| - 6 + 8 | 29.6 | 37.4 | 25.16 | 1.14 |
| - 8 +10 | 24.7 | 62.1 | 28.09 | 1.05 |
| -10 +14 | 16.1 | 78.2 | 28.96 | 0.95 |
| -14 +20 | 7.7 | 85.9 | 29.74 | 0.97 |
| -20 +28 | 5.0 | 90.9 | 29.72 | 0.89 |
| -28 +35 | 2.8 | 93.7 | 30.09 | 0.77 |
| -35 | 6.3 | 100.0 | 29.66 | 1.13 |
| | | | 27.22 | 1.04 |

## TABLE 3

## RECOVERY OF +6 MESH MATERIAL TO CONCENTRATE

+ 6 MESH MATERIAL

| | % +6 Recovered To Float | % +6 in Feed | % of +6 Mesh Feed Recovered | % of $K_2O$ Values Recovered | Recovery Ratio Test # 14/11 | |
|---|---|---|---|---|---|---|
| At 1.995 S.G. | | | | | | |
| TEST #11 | 15.6 | 9.5 | 1.5 | 3.2 | 2.6 | (Times as much on grade +6 mesh material) |
| TEST #14 | 9.5 | 41.3 | 3.9 | 9.75 | | |
| At 2.015 S.G. | | | | | | |
| TEST #11 | 19.9 | 9.5 | 1.9 | 4.1 | 2.8 | |
| TEST #14 | 12.8 | 41.3 | 5.3 | 13.25 | | |
| At 2.035 S.G. | | | | | | |
| TEST #11 | 21.1 | 9.5 | 2.0 | 4.2 | 3.0 | |
| TEST #14 | 14.7 | 41.3 | 6.1 | 15.0 | | |

# APPENDIX 1

Heavy Media Lab Work

SCSO/S Plus Mill Feed (Scrubbed)
-1/2" +1/4"

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | Distributions NaCl | Distributions W.I. | Calculated Head Grade K2O | Calculated Head Grade NaCl | Calculated Head Grade W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 854 | 1.99 F | 10.70 | 61.40 | 1.54 | 0.37 | 3.98 | 12.87 | 0.09 | 0.37 | 19.01 | 65.89 | 3.99 |
| 855 | S | 257.90 | 17.25 | 68.56 | 4.14 | 96.02 | 87.13 | 99.91 | 99.63 | | | |
| 856 | 2.01 F | 15.70 | 55.94 | 6.74 | 0.79 | 6.10 | 17.94 | 0.62 | 1.51 | 19.02 | 66.47 | 3.18 |
| 857 | S | 241.70 | 16.62 | 70.35 | 3.34 | 93.90 | 82.06 | 99.38 | 98.49 | | | |
| 858 | 2.03 F | 24.70 | 50.95 | 11.41 | 1.30 | 11.17 | 33.77 | 1.85 | 3.98 | 16.85 | 68.95 | 3.65 |
| 859 | S | 196.50 | 12.56 | 76.18 | 3.94 | 88.83 | 66.23 | 98.15 | 96.02 | | | |
| 860 | 2.05 F | 43.00 | 41.83 | 20.39 | 1.52 | 20.07 | 48.17 | 6.18 | 7.98 | 17.43 | 66.21 | 3.82 |
| 861 | S | 171.30 | 11.30 | 77.71 | 4.40 | 79.93 | 51.83 | 93.82 | 92.02 | | | |
| 862 | 2.07 F | 38.60 | 40.70 | 21.46 | 1.61 | 20.16 | 49.96 | 6.33 | 10.40 | 16.42 | 68.37 | 3.12 |
| 863 | S | 152.90 | 10.29 | 80.21 | 3.50 | 79.84 | 50.04 | 93.67 | 89.60 | | | |
| 864 | 2.10 F | 72.60 | 38.56 | 37.00 | 1.97 | 40.47 | 83.50 | 22.26 | 25.32 | 18.69 | 67.27 | 3.15 |
| 865 | S | 106.80 | 5.18 | 87.85 | 3.95 | 59.53 | 16.50 | 77.74 | 74.68 | | | |
| 866 | 2.15 F | 163.10 | 28.71 | 52.90 | 1.66 | 79.29 | 97.66 | 69.77 | 44.03 | 23.31 | 60.12 | 2.99 |
| 867 | S | 42.60 | 2.63 | 87.76 | 8.08 | 20.71 | 2.34 | 30.23 | 55.97 | | | |
| 868 | 2.20 F | 290.60 | 18.62 | 67.94 | 2.57 | 94.44 | 97.82 | 95.22 | 58.55 | 17.98 | 67.38 | 4.15 |
| 869 | S | 17.10 | 7.05 | 57.92 | 30.92 | 5.56 | 2.18 | 4.78 | 41.45 | | | |

Heavy Media Lab Work

SCSD/S Plus Mill Feed (Scrubbed)
-1/4" +4 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | Distributions NaCl | Distributions W.I. | Calculated Head Grade K2O | Calculated Head Grade NaCl | Calculated Head Grade W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 870 | 1.99 F | 20.70 | 61.66 | 1.26 | 0.41 | 8.20 | 27.37 | 0.15 | 1.46 | 18.48 | 68.38 | 2.31 |
| 871 | S | 231.70 | 14.62 | 74.38 | 2.48 | 91.80 | 72.63 | 99.85 | 98.54 | | | |
| 872 | 2.01 F | 32.10 | 58.46 | 4.27 | 0.70 | 15.74 | 51.66 | 0.97 | 4.90 | 17.81 | 69.16 | 2.25 |
| 873 | S | 171.80 | 10.22 | 81.28 | 2.54 | 84.26 | 48.34 | 99.03 | 95.10 | | | |
| 874 | 2.03 F | 33.30 | 54.34 | 8.36 | 0.75 | 18.45 | 50.85 | 2.36 | 5.68 | 19.71 | 65.46 | 2.44 |
| 875 | S | 147.20 | 11.88 | 78.38 | 2.82 | 81.55 | 49.15 | 97.64 | 94.32 | | | |
| 876 | 2.05 F | 40.30 | 48.67 | 13.84 | 1.05 | 22.24 | 62.56 | 4.53 | 8.30 | 17.30 | 68.00 | 2.82 |
| 877 | S | 140.90 | 8.33 | 83.49 | 3.32 | 77.76 | 37.44 | 95.47 | 91.70 | | | |
| 878 | 2.07 F | 53.40 | 51.37 | 17.63 | 1.06 | 31.71 | 77.64 | 8.78 | 10.77 | 20.98 | 63.67 | 3.12 |
| 879 | S | 115.00 | 6.87 | 85.05 | 4.08 | 68.29 | 22.36 | 91.22 | 89.23 | | | |
| 880 | 2.10 F | 62.00 | 42.41 | 31.47 | 1.40 | 37.19 | 85.67 | 17.16 | 19.56 | 18.41 | 68.19 | 2.66 |
| 881 | S | 104.70 | 4.20 | 89.94 | 3.41 | 62.81 | 14.33 | 82.84 | 80.44 | | | |
| 882 | 2.15 F | 131.60 | 28.33 | 53.56 | 1.60 | 65.12 | 97.65 | 51.69 | 39.68 | 18.89 | 67.48 | 2.63 |
| 883 | S | 70.50 | 1.27 | 93.45 | 4.54 | 34.88 | 2.35 | 48.31 | 60.32 | | | |
| 884 | 2.20 F | 301.50 | 19.03 | 67.88 | 2.00 | 95.87 | 98.83 | 96.47 | 57.62 | 18.46 | 67.45 | 3.33 |
| 885 | S | 13.00 | 5.24 | 57.59 | 34.12 | 4.13 | 1.17 | 3.53 | 42.38 | | | |

Heavy Media Lab Work

SCSQ/S Plus Mill Feed (Scrubbed)
-4 +5 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | NaCl | W.I. | Calculated Head Grade K2O | NaCl | W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 886 | 1.99 F | 21.30 | 61.89 | 1.05 | 0.38 | 12.11 | 41.52 | 0.18 | 1.85 | 18.05 | 68.87 | 2.49 |
| 887 | S | 154.60 | 12.01 | 78.21 | 2.78 | 87.89 | 58.48 | 99.82 | 98.15 | | | |
| 888 | 2.01 F | 25.20 | 60.12 | 2.64 | 0.66 | 16.40 | 54.28 | 0.63 | 4.53 | 18.16 | 68.61 | 2.39 |
| 889 | S | 128.50 | 9.93 | 81.55 | 2.73 | 83.60 | 45.72 | 99.37 | 95.47 | | | |
| 890 | 2.03 F | 29.70 | 56.95 | 5.74 | 0.77 | 19.05 | 61.33 | 1.59 | 5.70 | 17.69 | 68.78 | 2.58 |
| 891 | S | 126.20 | 8.45 | 83.62 | 3.00 | 80.95 | 38.67 | 98.41 | 94.30 | | | |
| 892 | 2.05 F | 39.40 | 56.63 | 9.64 | 0.72 | 25.27 | 72.35 | 3.68 | 7.42 | 19.78 | 66.23 | 2.45 |
| 893 | S | 116.50 | 7.32 | 85.37 | 3.04 | 74.73 | 27.65 | 96.32 | 92.58 | | | |
| 894 | 2.07 F | 47.30 | 54.04 | 13.34 | 1.12 | 29.09 | 80.71 | 5.81 | 13.44 | 19.48 | 66.74 | 2.42 |
| 895 | S | 115.30 | 5.30 | 88.65 | 2.96 | 70.91 | 19.29 | 94.19 | 86.56 | | | |
| 896 | 2.10 F | 59.20 | 47.17 | 24.15 | 1.19 | 35.90 | 88.87 | 12.88 | 17.02 | 19.06 | 67.33 | 2.51 |
| 897 | S | 105.70 | 3.31 | 91.51 | 3.25 | 64.10 | 11.13 | 87.12 | 82.98 | | | |
| 898 | 2.15 F | 111.00 | 30.21 | 50.82 | 1.36 | 60.99 | 97.78 | 45.62 | 37.07 | 18.84 | 67.94 | 2.24 |
| 899 | S | 71.00 | 1.07 | 94.70 | 3.61 | 39.01 | 2.22 | 54.38 | 62.93 | | | |
| 900 | 2.20 F | 273.60 | 19.47 | 67.33 | 1.85 | 96.10 | 98.84 | 96.72 | 56.66 | 18.93 | 66.90 | 3.14 |
| 901 | S | 11.10 | 5.63 | 56.21 | 34.88 | 3.90 | 1.16 | 3.28 | 43.34 | | | |

Heavy Media Lab Work

SCSQ/S Plus Mill Feed (Scrubbed)
-5 +6 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | NaCl | W.I. | Calculated Head Grade K2O | NaCl | W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 902 | 1.99 F | 26.40 | 62.10 | 0.87 | 0.33 | 15.39 | 47.76 | 0.20 | 2.23 | 20.02 | 65.97 | 2.28 |
| 903 | S | 145.10 | 12.36 | 77.81 | 2.63 | 84.61 | 52.24 | 99.80 | 97.77 | | | |
| 904 | 2.01 F | 37.30 | 60.13 | 2.66 | 0.61 | 21.70 | 63.54 | 0.89 | 5.58 | 20.53 | 64.79 | 2.37 |
| 905 | S | 134.60 | 9.56 | 82.01 | 2.86 | 78.30 | 36.46 | 99.11 | 94.42 | | | |
| 906 | 2.03 F | 43.00 | 60.32 | 3.96 | 0.56 | 23.38 | 71.00 | 1.39 | 6.06 | 19.87 | 66.40 | 2.16 |
| 907 | S | 140.90 | 7.52 | 85.45 | 2.65 | 76.62 | 29.00 | 98.61 | 93.94 | | | |
| 908 | 2.05 F | 49.70 | 57.53 | 8.18 | 0.76 | 28.85 | 79.84 | 3.62 | 11.01 | 20.79 | 65.11 | 1.99 |
| 909 | S | 122.60 | 5.89 | 88.19 | 2.49 | 71.15 | 20.16 | 96.38 | 88.99 | | | |
| 910 | 2.07 F | 58.40 | 55.64 | 10.95 | 0.98 | 30.88 | 83.48 | 5.20 | 12.93 | 20.58 | 65.08 | 2.34 |
| 911 | S | 130.70 | 4.92 | 89.26 | 2.95 | 69.12 | 16.52 | 94.80 | 87.07 | | | |
| 912 | 2.10 F | 71.00 | 50.66 | 18.51 | 1.30 | 39.20 | 92.11 | 11.44 | 20.71 | 21.56 | 63.41 | 2.46 |
| 913 | S | 110.10 | 2.80 | 92.36 | 3.21 | 60.80 | 7.89 | 88.56 | 79.29 | | | |
| 914 | 2.15 F | 124.30 | 34.12 | 44.75 | 1.24 | 60.19 | 98.30 | 41.66 | 32.92 | 20.89 | 64.66 | 2.27 |
| 915 | S | 82.20 | 0.89 | 94.77 | 3.82 | 39.81 | 1.70 | 58.34 | 67.08 | | | |
| 916 | 2.20 F | 281.70 | 22.09 | 63.36 | 1.67 | 95.49 | 98.82 | 95.67 | 53.75 | 21.35 | 63.24 | 2.97 |
| 917 | S | 13.30 | 5.59 | 60.71 | 30.44 | 4.51 | 1.18 | 4.33 | 46.25 | | | |

Heavy Media Lab Work

SCSQ/S Plus Mill Feed (Scrubbed)
-6 +8 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | Distributions NaCl | Distributions W.I. | Calculated Head Grade K2O | Calculated Head Grade NaCl | Calculated Head Grade W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 918 | 1.99 F | 43.50 | 62.38 | 1.06 | 0.20 | 21.95 | 60.57 | 0.37 | 2.19 | 22.60 | 62.21 | 2.00 |
| 919 | S | 154.70 | 11.42 | 79.41 | 2.51 | 78.05 | 39.43 | 99.63 | 97.81 | | | |
| 920 | 2.01 F | 47.80 | 61.73 | 1.79 | 0.50 | 26.08 | 72.21 | 0.75 | 6.03 | 22.29 | 62.55 | 2.16 |
| 921 | S | 135.50 | 8.38 | 83.99 | 2.75 | 73.92 | 27.79 | 99.25 | 93.97 | | | |
| 922 | 2.03 F | 53.00 | 60.72 | 3.33 | 0.56 | 29.43 | 79.62 | 1.57 | 7.93 | 22.44 | 62.40 | 2.08 |
| 923 | S | 127.10 | 6.48 | 87.03 | 2.71 | 70.57 | 20.38 | 98.43 | 92.07 | | | |
| 924 | 2.05 F | 57.60 | 58.86 | 6.12 | 0.71 | 32.40 | 86.27 | 3.14 | 12.02 | 22.10 | 63.10 | 1.91 |
| 925 | S | 120.20 | 4.49 | 90.40 | 2.49 | 67.60 | 13.73 | 96.86 | 87.98 | | | |
| 926 | 2.07 F | 61.30 | 57.69 | 7.82 | 0.87 | 35.87 | 90.77 | 4.53 | 15.37 | 22.80 | 61.89 | 2.03 |
| 927 | S | 109.60 | 3.28 | 92.13 | 2.68 | 64.13 | 9.23 | 95.47 | 84.63 | | | |
| 928 | 2.10 F | 67.30 | 53.47 | 14.20 | 1.16 | 40.44 | 94.14 | 9.34 | 21.66 | 22.97 | 61.47 | 2.17 |
| 929 | S | 99.10 | 2.26 | 93.57 | 2.85 | 59.56 | 5.86 | 90.66 | 78.34 | | | |
| 930 | 2.15 F | 122.60 | 39.30 | 36.65 | 1.14 | 60.07 | 98.52 | 36.74 | 31.91 | 23.96 | 59.92 | 2.15 |
| 931 | S | 81.50 | 0.89 | 94.93 | 3.66 | 39.93 | 1.48 | 63.26 | 68.09 | | | |
| 932 | 2.20 F | 287.20 | 22.78 | 62.31 | 1.63 | 95.80 | 99.17 | 95.64 | 56.78 | 22.01 | 62.42 | 2.75 |
| 933 | S | 12.60 | 4.36 | 64.82 | 28.28 | 4.20 | 0.83 | 4.36 | 43.22 | | | |

Heavy Media Lab Work

SCSQ/S Plus Mill Feed (Scrubbed)
-8 +10 Mesh

| | | | | | | | Distributions | | | | Calculated Head Grade | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | K2O | NaCl | W.I. | K2O | NaCl | W.I. |
| 934 | 1.99 F | 51.60 | 61.78 | 1.83 | 0.38 | 27.49 | 69.52 | 0.85 | 4.72 | 24.43 | 59.11 | 2.21 |
| 935 | S | 136.10 | 10.27 | 80.83 | 2.91 | 72.51 | 30.48 | 99.15 | 95.28 | | | |
| 936 | 2.01 F | 52.80 | 62.04 | 1.24 | 0.56 | 32.43 | 82.72 | 0.68 | 8.59 | 24.32 | 59.38 | 2.11 |
| 937 | S | 110.00 | 6.22 | 87.29 | 2.86 | 67.57 | 17.28 | 99.32 | 91.41 | | | |
| 938 | 2.03 F | 56.20 | 60.92 | 2.92 | 0.65 | 36.80 | 87.58 | 1.87 | 12.38 | 25.60 | 57.55 | 1.93 |
| 939 | S | 96.50 | 5.03 | 89.36 | 2.68 | 63.20 | 12.42 | 98.13 | 87.62 | | | |
| 940 | 2.05 F | 60.00 | 60.49 | 3.42 | 0.83 | 39.06 | 91.59 | 2.34 | 16.31 | 25.80 | 57.18 | 1.99 |
| 941 | S | 93.60 | 3.56 | 91.64 | 2.73 | 60.94 | 8.41 | 97.66 | 83.69 | | | |
| 942 | 2.07 F | 64.70 | 59.26 | 5.31 | 0.89 | 40.39 | 93.98 | 3.71 | 18.65 | 25.47 | 57.76 | 1.93 |
| 943 | S | 95.50 | 2.57 | 93.30 | 2.63 | 59.61 | 6.02 | 96.29 | 81.35 | | | |
| 944 | 2.10 F | 68.20 | 57.11 | 8.62 | 0.98 | 42.65 | 96.28 | 6.34 | 20.95 | 25.30 | 57.96 | 2.00 |
| 945 | S | 91.70 | 1.64 | 94.65 | 2.75 | 57.35 | 3.72 | 93.66 | 79.05 | | | |
| 946 | 2.15 F | 113.20 | 43.16 | 30.70 | 0.98 | 59.55 | 99.06 | 32.02 | 31.62 | 25.94 | 57.09 | 1.85 |
| 947 | S | 76.90 | 0.60 | 95.93 | 3.12 | 40.45 | 0.94 | 67.98 | 68.38 | | | |
| 948 | 2.20 F | 304.50 | 24.86 | 59.28 | 1.37 | 96.09 | 99.31 | 95.91 | 51.88 | 24.05 | 59.39 | 2.54 |
| 949 | S | 12.40 | 4.22 | 62.12 | 31.20 | 3.91 | 0.69 | 4.09 | 48.12 | | | |

Heavy Media Lab Work

SCSD/S Plus Mill Feed (Scrubbed)
-10 +14 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | NaCl | W.I. | Calculated Head Grade K2O | NaCl | W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 950 | 1.99 F | 61.70 | 62.31 | 0.89 | 0.48 | 31.37 | 75.30 | 0.49 | 7.06 | 25.96 | 56.78 | 2.13 |
| 951 | S | 135.00 | 9.34 | 82.33 | 2.89 | 68.63 | 24.70 | 99.51 | 92.94 | | | |
| 952 | 2.01 F | 58.20 | 61.96 | 1.44 | 0.49 | 35.68 | 87.30 | 0.89 | 9.27 | 25.33 | 58.03 | 1.89 |
| 953 | S | 104.90 | 5.00 | 89.43 | 2.66 | 64.32 | 12.70 | 99.11 | 90.73 | | | |
| 954 | 2.03 F | 60.60 | 61.45 | 2.11 | 0.62 | 39.63 | 91.64 | 1.49 | 13.81 | 26.58 | 56.16 | 1.78 |
| 955 | S | 92.30 | 3.68 | 91.64 | 2.54 | 60.37 | 8.36 | 98.51 | 86.19 | | | |
| 956 | 2.05 F | 56.00 | 60.83 | 2.88 | 0.83 | 40.79 | 94.60 | 2.07 | 19.37 | 26.23 | 56.74 | 1.75 |
| 957 | S | 81.30 | 2.39 | 93.84 | 2.38 | 59.21 | 5.40 | 97.93 | 80.63 | | | |
| 958 | 2.07 F | 57.90 | 60.37 | 3.64 | 0.80 | 43.24 | 95.67 | 2.86 | 20.12 | 27.29 | 55.09 | 1.72 |
| 959 | S | 76.00 | 2.08 | 94.29 | 2.42 | 56.76 | 4.33 | 97.14 | 79.88 | | | |
| 960 | 2.10 F | 62.20 | 58.72 | 6.24 | 0.81 | 43.77 | 97.55 | 4.82 | 21.30 | 26.35 | 56.63 | 1.66 |
| 961 | S | 79.90 | 1.15 | 95.85 | 2.33 | 56.23 | 2.45 | 95.18 | 78.70 | | | |
| 962 | 2.15 F | 95.00 | 43.36 | 30.56 | 0.81 | 63.42 | 99.25 | 35.58 | 30.50 | 27.71 | 54.46 | 1.68 |
| 963 | S | 54.80 | 0.57 | 95.90 | 3.20 | 36.58 | 0.75 | 64.42 | 69.50 | | | |
| 964 | 2.20 F | 315.50 | 28.91 | 53.02 | 1.22 | 96.31 | 99.47 | 95.67 | 50.52 | 27.99 | 53.37 | 2.33 |
| 965 | S | 12.10 | 4.00 | 62.51 | 31.16 | 3.69 | 0.53 | 4.33 | 49.48 | | | |

Heavy Media Lab Work

SCSQ/S Plus Mill Feed (Scrubbed)
-14 +20 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | Distributions NaCl | Distributions W.I. | Calculated Head Grade K2O | Calculated Head Grade NaCl | Calculated Head Grade W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 966 | 1.99 F | 43.80 | 62.37 | 0.84 | 0.44 | 33.61 | 78.48 | 0.51 | 6.73 | 26.71 | 55.51 | 2.20 |
| 967 | S | 86.50 | 8.66 | 83.20 | 3.09 | 66.39 | 21.52 | 99.49 | 93.27 | | | |
| 968 | 2.01 F | 46.90 | 60.84 | 3.12 | 0.58 | 39.31 | 90.00 | 2.19 | 11.33 | 26.58 | 55.92 | 2.01 |
| 969 | S | 72.40 | 4.38 | 90.13 | 2.94 | 60.69 | 10.00 | 97.81 | 88.67 | | | |
| 970 | 2.03 F | 51.20 | 60.69 | 3.43 | 0.51 | 40.70 | 92.39 | 2.49 | 13.31 | 26.73 | 56.12 | 1.56 |
| 971 | S | 74.60 | 3.43 | 92.29 | 2.28 | 59.30 | 7.61 | 97.51 | 86.69 | | | |
| 972 | 2.05 F | 58.90 | 60.45 | 3.67 | 0.65 | 44.02 | 95.65 | 2.98 | 16.48 | 27.82 | 54.23 | 1.74 |
| 973 | S | 74.90 | 2.16 | 93.99 | 2.59 | 55.98 | 4.35 | 97.02 | 83.52 | | | |
| 974 | 2.07 F | 57.00 | 60.57 | 3.44 | 0.69 | 44.02 | 96.79 | 2.77 | 17.60 | 27.54 | 54.68 | 1.73 |
| 975 | S | 72.50 | 1.58 | 94.96 | 2.54 | 55.98 | 3.21 | 97.23 | 82.40 | | | |
| 976 | 2.10 F | 49.80 | 59.43 | 5.22 | 0.71 | 46.59 | 98.18 | 4.52 | 20.37 | 28.20 | 53.74 | 1.62 |
| 977 | S | 57.10 | 0.96 | 96.06 | 2.42 | 53.41 | 1.82 | 95.48 | 79.63 | | | |
| 978 | 2.15 F | 87.80 | 42.39 | 32.18 | 0.72 | 64.99 | 99.38 | 38.33 | 30.06 | 27.72 | 54.56 | 1.56 |
| 979 | S | 47.30 | 0.49 | 96.11 | 3.11 | 35.01 | 0.62 | 61.67 | 69.94 | | | |
| 980 | 2.20 F | 314.90 | 28.49 | 53.70 | 1.20 | 96.60 | 99.51 | 96.10 | 51.61 | 27.66 | 53.97 | 2.25 |
| 981 | S | 11.10 | 4.00 | 61.75 | 31.92 | 3.40 | 0.49 | 3.90 | 48.39 | | | |

Heavy Media Lab Work

SCSO'S Plus Mill Feed (Scrubbed) June 25 86
-1/2" + 1/4"

| | | | | | | | | Distributions | | | | Calculated Head Grade | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | K2O | NaCl | W.I. | K2O | NaCl | W.I. |
| 993 | 1.99 F | 16.80 | 61.45 | 2.42 | 0.31 | 6.38 | 23.35 | 0.22 | 0.71 | 16.78 | 70.63 | 2.80 |
| 994 | S | 246.70 | 13.74 | 75.28 | 2.97 | 93.62 | 76.65 | 99.78 | 99.29 | | | |
| 995 | 2.01 F | 17.80 | 60.55 | 3.63 | 0.53 | 8.99 | 30.71 | 0.47 | 2.06 | 17.73 | 69.62 | 2.31 |
| 996 | S | 180.10 | 13.50 | 76.14 | 2.49 | 91.01 | 69.29 | 99.53 | 97.94 | | | |
| 997 | 2.03 F | 26.20 | 57.86 | 7.60 | 0.82 | 15.69 | 51.50 | 1.72 | 4.37 | 17.63 | 69.16 | 2.94 |
| 998 | S | 140.80 | 10.14 | 80.61 | 3.34 | 84.31 | 48.50 | 98.28 | 95.63 | | | |
| 999 | 2.05 F | 26.30 | 52.65 | 14.99 | 1.67 | 18.18 | 55.62 | 3.88 | 11.96 | 17.20 | 70.23 | 2.54 |
| 1000 | S | 118.40 | 9.33 | 82.50 | 2.73 | 81.82 | 44.38 | 96.12 | 88.04 | | | |
| 1001 | 2.07 F | 36.90 | 47.86 | 23.28 | 0.96 | 24.07 | 64.34 | 8.08 | 9.87 | 17.91 | 69.32 | 2.34 |
| 1002 | S | 116.40 | 8.41 | 83.91 | 2.78 | 75.93 | 35.66 | 91.92 | 90.13 | | | |
| 1003 | 2.10 F | 63.90 | 43.24 | 30.02 | 1.54 | 39.27 | 84.22 | 18.13 | 19.78 | 20.16 | 65.03 | 3.06 |
| 1004 | S | 98.80 | 5.24 | 87.67 | 4.04 | 60.73 | 15.78 | 81.87 | 80.22 | | | |
| 1005 | 2.15 F | 217.90 | 25.62 | 57.86 | 1.59 | 81.55 | 98.98 | 73.05 | 64.96 | 21.11 | 64.59 | 2.00 |
| 1006 | S | 49.30 | 1.17 | 94.36 | 3.79 | 18.45 | 1.02 | 26.95 | 35.04 | | | |
| 1007 | 2.20 F | 336.00 | 18.12 | 69.30 | 2.02 | 96.28 | 99.57 | 96.12 | 70.83 | 17.52 | 69.41 | 2.75 |
| 1008 | S | 13.00 | 2.03 | 72.29 | 21.50 | 3.72 | 0.43 | 3.88 | 29.17 | | | |
| | | | | ton | 32 | | | | | | | |

Heavy Media Lab Work

SCSO'S Plus Mill Feed (Scrubbed) June 25 86
-1/4" + 4 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | Distributions NaCl | Distributions W.I. | Calculated Head Grade K2O | Calculated Head Grade NaCl | Calculated Head Grade W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1009 | 1.99 F | 24.40 | 62.06 | 1.42 | 0.35 | 11.76 | 43.49 | 0.23 | 2.03 | 16.79 | 71.40 | 2.03 |
| 1010 | S | 183.00 | 10.75 | 80.73 | 2.25 | 88.24 | 56.51 | 99.77 | 97.97 | | | |
| 1011 | 2.01 F | 32.20 | 61.08 | 2.80 | 0.52 | 17.81 | 60.59 | 0.71 | 5.26 | 17.95 | 69.82 | 1.76 |
| 1012 | S | 148.60 | 8.61 | 84.34 | 2.03 | 82.19 | 39.41 | 99.29 | 94.74 | | | |
| 1013 | 2.03 F | 44.40 | 60.30 | 3.84 | 0.71 | 23.81 | 72.16 | 1.37 | 9.98 | 19.89 | 66.81 | 1.69 |
| 1014 | S | 142.10 | 7.27 | 86.49 | 2.00 | 76.19 | 27.84 | 98.63 | 90.02 | | | |
| 1015 | 2.05 F | 44.80 | 56.36 | 9.89 | 0.90 | 25.17 | 76.02 | 3.64 | 11.37 | 18.66 | 68.47 | 1.99 |
| 1016 | S | 133.20 | 5.98 | 88.17 | 2.36 | 74.83 | 23.98 | 96.36 | 88.63 | | | |
| 1017 | 2.07 F | 47.10 | 53.17 | 15.07 | 0.77 | 25.81 | 78.35 | 5.53 | 10.12 | 17.51 | 70.31 | 1.96 |
| 1018 | S | 135.40 | 5.11 | 89.53 | 2.38 | 74.19 | 21.65 | 94.47 | 89.88 | | | |
| 1019 | 2.10 F | 66.10 | 48.48 | 22.18 | 1.08 | 31.51 | 88.88 | 9.87 | 16.86 | 17.19 | 70.78 | 2.02 |
| 1020 | S | 143.70 | 2.79 | 93.13 | 2.45 | 68.49 | 11.12 | 90.13 | 83.14 | | | |
| 1021 | 2.15 F | 144.20 | 29.20 | 52.70 | 1.08 | 67.04 | 98.28 | 53.04 | 38.23 | 19.92 | 66.61 | 1.86 |
| 1022 | S | 70.90 | 1.04 | 94.89 | 3.46 | 32.96 | 1.72 | 46.96 | 61.17 | | | |
| 1023 | 2.20 F | 381.90 | 19.10 | 68.28 | 1.49 | 97.13 | 99.84 | 96.83 | 68.79 | 18.58 | 68.49 | 2.10 |
| 1024 | S | 11.30 | 1.06 | 75.47 | 22.85 | 2.87 | 0.16 | 3.17 | 31.21 | | | |

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Heavy Media Lab Work

SCSO'S Plus Mill Feed (Scrubbed) June 25 86
-4 + 5 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | Distributions NaCl | Distributions W.I. | Calculated Head Grade K2O | Calculated Head Grade NaCl | Calculated Head Grade W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1025 | 1.99 F | 35.20 | 62.25 | 1.25 | 0.22 | 18.75 | 61.59 | 0.34 | 2.21 | 18.95 | 68.29 | 1.87 |
| 1026 | S | 152.50 | 8.96 | 83.76 | 2.25 | 81.25 | 38.41 | 99.66 | 97.79 | | | |
| 1027 | 2.01 F | 36.00 | 61.67 | 2.04 | 0.35 | 22.06 | 69.11 | 0.67 | 4.88 | 19.68 | 67.26 | 1.58 |
| 1028 | S | 127.20 | 7.80 | 85.72 | 1.93 | 77.94 | 30.89 | 99.33 | 95.12 | | | |
| 1029 | 2.03 F | 39.10 | 60.69 | 3.37 | 0.57 | 26.85 | 79.69 | 1.37 | 8.98 | 20.45 | 65.92 | 1.70 |
| 1030 | S | 106.50 | 5.68 | 88.89 | 2.12 | 73.15 | 20.31 | 98.63 | 91.02 | | | |
| 1031 | 2.05 F | 44.70 | 58.45 | 6.67 | 0.81 | 29.68 | 86.17 | 2.98 | 14.23 | 20.13 | 66.44 | 1.69 |
| 1032 | S | 105.90 | 3.96 | 91.67 | 2.06 | 70.32 | 13.83 | 97.02 | 85.77 | | | |
| 1033 | 2.07 F | 43.40 | 55.59 | 11.05 | 0.96 | 29.03 | 86.07 | 4.66 | 18.68 | 18.75 | 68.83 | 1.49 |
| 1034 | S | 106.10 | 3.68 | 92.47 | 1.71 | 70.97 | 13.93 | 95.34 | 81.32 | | | |
| 1035 | 2.10 F | 56.80 | 51.45 | 17.45 | 1.02 | 37.52 | 93.44 | 9.94 | 26.72 | 20.66 | 65.84 | 1.43 |
| 1036 | S | 94.60 | 2.17 | 94.89 | 1.68 | 62.48 | 6.56 | 90.06 | 73.28 | | | |
| 1037 | 2.15 F | 126.60 | 32.34 | 47.79 | 1.02 | 63.87 | 98.65 | 46.99 | 34.40 | 20.94 | 64.96 | 1.89 |
| 1038 | S | 71.60 | 0.78 | 95.33 | 3.44 | 36.13 | 1.35 | 53.01 | 65.60 | | | |
| 1039 | 2.20 F | 270.60 | 22.21 | 63.70 | 1.14 | 97.62 | 99.69 | 97.42 | 64.06 | 21.75 | 63.83 | 1.74 |
| 1040 | S | 6.60 | 2.83 | 69.30 | 26.22 | 2.38 | 0.31 | 2.58 | 35.94 | | | |

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Heavy Media Lab Work

SCSO'S Plus Mill Feed (Scrubbed) June 25 86
-5 + 6 Mesh

| | | | | | | | Distributions | | | | Calculated Head Grade | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | K2O | NaCl | W.I. | K2O | NaCl | W.I. |
| 1041 | 1.99 F | 45.10 | 62.51 | 0.76 | 0.31 | 22.55 | 68.52 | 0.26 | 4.18 | 20.57 | 65.77 | 1.67 |
| 1042 | S | 154.90 | 8.36 | 84.70 | 2.07 | 77.45 | 31.48 | 99.74 | 95.82 | | | |
| 1043 | 2.01 F | 45.90 | 61.77 | 1.80 | 0.43 | 25.36 | 74.64 | 0.70 | 6.50 | 20.99 | 65.10 | 1.68 |
| 1044 | S | 135.10 | 7.13 | 86.61 | 2.10 | 74.64 | 25.36 | 99.30 | 93.50 | | | |
| 1045 | 2.03 F | 50.00 | 60.77 | 3.19 | 0.62 | 28.79 | 83.03 | 1.41 | 10.31 | 21.07 | 64.92 | 1.73 |
| 1046 | S | 123.70 | 5.02 | 89.87 | 2.18 | 71.21 | 16.97 | 98.59 | 89.69 | | | |
| 1047 | 2.05 F | 54.60 | 58.91 | 6.00 | 0.75 | 31.34 | 87.08 | 2.91 | 12.72 | 21.20 | 64.58 | 1.85 |
| 1048 | S | 119.60 | 3.99 | 91.33 | 2.35 | 68.66 | 12.92 | 97.09 | 87.28 | | | |
| 1049 | 2.07 F | 58.60 | 57.91 | 7.43 | 0.91 | 32.36 | 89.13 | 3.70 | 17.17 | 21.02 | 65.01 | 1.71 |
| 1050 | S | 122.50 | 3.38 | 92.55 | 2.10 | 67.64 | 10.87 | 96.30 | 82.83 | | | |
| 1051 | 2.10 F | 70.60 | 54.37 | 13.17 | 0.77 | 38.12 | 94.31 | 7.89 | 18.64 | 21.98 | 63.64 | 1.57 |
| 1052 | S | 114.60 | 2.02 | 94.73 | 2.07 | 61.88 | 5.69 | 92.11 | 81.36 | | | |
| 1053 | 2.15 F | 114.50 | 37.72 | 39.11 | 1.18 | 59.23 | 99.11 | 36.98 | 41.77 | 22.54 | 62.64 | 1.67 |
| 1054 | S | 78.80 | 0.49 | 96.83 | 2.39 | 40.77 | 0.89 | 63.02 | 58.23 | | | |
| 1055 | 2.20 F | 314.40 | 20.54 | 66.17 | 1.32 | 97.34 | 99.62 | 97.36 | 61.81 | 20.07 | 66.16 | 2.08 |
| 1056 | S | 8.60 | 2.86 | 65.65 | 29.82 | 2.66 | 0.38 | 2.64 | 38.19 | | | |

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Heavy Media Lab Work

SCSD'S Plus Mill Feed (Scrubbed) June 25 86
-6 + 8 Mesh

| | | | | | | | Distributions | | | | Calculated Head Grade | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | K2O | NaCl | W.I. | K2O | NaCl | W.I. |
| 1057 | 1.99 F | 62.50 | 62.07 | 1.23 | 0.52 | 28.54 | 74.31 | 0.58 | 7.42 | 23.84 | 60.26 | 2.00 |
| 1058 | S | 156.50 | 8.57 | 83.84 | 2.59 | 71.46 | 25.69 | 99.42 | 92.58 | | | |
| 1059 | 2.01 F | 52.70 | 61.96 | 1.33 | 0.60 | 30.48 | 81.01 | 0.66 | 9.59 | 23.31 | 61.19 | 1.91 |
| 1060 | S | 120.20 | 6.37 | 87.44 | 2.48 | 69.52 | 18.99 | 99.34 | 90.41 | | | |
| 1061 | 2.03 F | 59.90 | 60.62 | 3.33 | 0.72 | 33.73 | 86.88 | 1.85 | 12.92 | 23.53 | 60.87 | 1.88 |
| 1062 | S | 117.70 | 4.66 | 90.15 | 2.47 | 66.27 | 13.12 | 98.15 | 87.08 | | | |
| 1063 | 2.05 F | 64.50 | 60.50 | 3.54 | 0.70 | 35.93 | 91.36 | 2.10 | 15.20 | 23.80 | 60.68 | 1.65 |
| 1064 | S | 115.00 | 3.21 | 92.73 | 2.19 | 64.07 | 8.64 | 97.90 | 84.80 | | | |
| 1065 | 2.07 F | 67.60 | 59.54 | 4.91 | 0.85 | 37.83 | 93.18 | 3.10 | 17.61 | 24.17 | 59.92 | 1.83 |
| 1066 | S | 111.10 | 2.65 | 93.39 | 2.42 | 62.17 | 6.82 | 96.90 | 82.39 | | | |
| 1067 | 2.10 F | 70.90 | 57.69 | 7.65 | 1.04 | 40.12 | 95.46 | 5.15 | 21.01 | 24.25 | 59.63 | 1.99 |
| 1068 | S | 105.80 | 1.84 | 94.47 | 2.62 | 59.88 | 4.54 | 94.85 | 78.99 | | | |
| 1069 | 2.15 F | 127.40 | 42.02 | 32.43 | 1.06 | 57.21 | 99.24 | 38.56 | 30.49 | 24.22 | 48.12 | 1.99 |
| 1070 | S | 95.30 | 0.43 | 69.09 | 3.23 | 42.79 | 0.76 | 61.44 | 69.51 | | | |
| 1071 | 2.20 F | 301.20 | 24.66 | 59.66 | 1.31 | 96.29 | 99.34 | 96.17 | 51.82 | 23.90 | 59.73 | 2.43 |
| 1072 | S | 11.60 | 4.27 | 61.61 | 31.63 | 3.71 | 0.66 | 3.83 | 48.18 | | | |

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Heavy Media Lab Work

SCSO'S Plus Mill Feed (Scrubbed) June 25 86
-8 + 10 Mesh

| Sample # | SG | wt. | % K20 | % NaCl | % W.I. | wt % | Distributions K20 | NaCl | W.I. | Calculated Head Grade K20 | NaCl | W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1073 | 1.99 F | 67.30 | 62.09 | 1.47 | 0.25 | 32.59 | 80.66 | 0.82 | 4.61 | 25.09 | 58.52 | 1.77 |
| 1074 | S | 139.20 | 7.20 | 86.10 | 2.50 | 67.41 | 19.34 | 99.18 | 95.39 | | | |
| 1075 | 2.01 F | 68.10 | 61.51 | 2.89 | 0.35 | 36.99 | 87.29 | 1.87 | 6.84 | 26.07 | 57.07 | 1.89 |
| 1076 | S | 116.00 | 5.26 | 88.87 | 2.80 | 63.01 | 12.71 | 98.13 | 93.16 | | | |
| 1077 | 2.03 F | 63.90 | 61.54 | 2.09 | 0.50 | 36.70 | 90.12 | 1.31 | 9.90 | 25.06 | 58.47 | 1.85 |
| 1078 | S | 110.20 | 3.91 | 91.17 | 2.64 | 63.30 | 9.88 | 98.69 | 90.10 | | | |
| 1079 | 2.05 F | 68.50 | 60.78 | 3.12 | 0.67 | 39.17 | 94.11 | 2.10 | 14.18 | 25.30 | 58.11 | 1.85 |
| 1080 | S | 106.40 | 2.45 | 93.51 | 2.61 | 60.83 | 5.89 | 97.90 | 85.82 | | | |
| 1081 | 2.07 F | 70.80 | 60.49 | 3.51 | 0.74 | 41.04 | 95.94 | 2.52 | 16.70 | 25.88 | 57.22 | 1.82 |
| 1082 | S | 101.70 | 1.78 | 94.61 | 2.57 | 58.96 | 4.06 | 97.48 | 83.30 | | | |
| 1083 | 2.10 F | 75.40 | 59.40 | 5.17 | 0.81 | 43.06 | 97.33 | 3.94 | 18.60 | 26.28 | 56.53 | 1.87 |
| 1084 | S | 99.70 | 1.23 | 95.37 | 2.68 | 56.94 | 2.67 | 96.06 | 81.40 | | | |
| 1085 | 2.15 F | 111.40 | 44.18 | 29.14 | 0.93 | 58.79 | 99.40 | 30.15 | 30.04 | 26.13 | 56.82 | 1.82 |
| 1086 | S | 78.10 | 0.38 | 96.31 | 3.09 | 41.21 | 0.60 | 69.85 | 69.96 | | | |
| 1087 | 2.20 F | 300.20 | 27.35 | 55.51 | 1.20 | 95.82 | 99.49 | 95.36 | 45.51 | 26.34 | 55.78 | 2.53 |
| 1088 | S | 13.10 | 3.24 | 61.94 | 32.93 | 4.18 | 0.51 | 4.64 | 54.49 | | | |

Heavy Media Lab Work

SCSO'S Plus Mill Feed (Scrubbed) June 25 86
-10 + 14 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | NaCl | W.I. | Calculated Head Grade K2O | NaCl | W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1089 | 1.99 F | 71.30 | 62.00 | 1.06 | 0.80 | 37.25 | 87.25 | 0.70 | 16.52 | 26.47 | 56.29 | 1.80 |
| 1090 | S | 120.10 | 5.38 | 89.08 | 2.40 | 62.75 | 12.75 | 99.30 | 83.48 | | | |
| 1091 | 2.01 F | 60.00 | 62.45 | 0.74 | 0.41 | 39.32 | 91.00 | 0.52 | 9.44 | 26.98 | 55.58 | 1.71 |
| 1092 | S | 92.60 | 4.00 | 91.12 | 2.55 | 60.68 | 9.00 | 99.48 | 90.56 | | | |
| 1093 | 2.03 F | 60.50 | 62.14 | 1.18 | 0.46 | 40.55 | 93.64 | 0.86 | 11.56 | 26.91 | 55.79 | 1.61 |
| 1094 | S | 88.70 | 2.88 | 93.04 | 2.40 | 59.45 | 6.36 | 99.14 | 88.44 | | | |
| 1095 | 2.05 F | 63.60 | 61.73 | 1.72 | 0.57 | 42.46 | 96.02 | 1.32 | 15.07 | 27.30 | 55.19 | 1.61 |
| 1096 | S | 86.20 | 1.89 | 94.64 | 2.37 | 57.54 | 3.98 | 98.68 | 84.93 | | | |
| 1097 | 2.07 F | 63.50 | 61.09 | 2.68 | 0.62 | 42.45 | 96.82 | 2.04 | 14.08 | 26.78 | 55.74 | 1.87 |
| 1098 | S | 86.10 | 1.48 | 94.87 | 2.79 | 57.55 | 3.18 | 97.96 | 85.92 | | | |
| 1099 | 2.10 F | 65.30 | 60.31 | 3.42 | 1.12 | 44.21 | 98.03 | 2.75 | 25.60 | 27.20 | 55.01 | 1.93 |
| 1100 | S | 82.40 | 0.96 | 95.90 | 2.58 | 55.79 | 1.97 | 97.25 | 74.40 | | | |
| 1101 | 2.15 F | 121.00 | 44.06 | 29.44 | 0.82 | 63.72 | 99.41 | 35.07 | 28.86 | 28.24 | 53.49 | 1.81 |
| 1102 | S | 68.90 | 0.46 | 95.72 | 3.55 | 36.28 | 0.59 | 64.93 | 71.14 | | | |
| 1103 | 2.20 F | 289.20 | 28.72 | 53.54 | 1.00 | 95.83 | 99.48 | 5.27 | 40.61 | 27.67 | 53.85 | 2.36 |
| 1104 | S | 12.60 | 3.46 | 60.95 | 33.57 | 4.17 | 0.52 | 4.73 | 59.39 | | | |

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Heavy Media Lab Work

SCSO'S Plus Mill Feed (Scrubbed) June 25 86
-14 + 20 Mesh

| Sample # | SG | wt. | % K2O | % NaCl | % W.I. | wt % | Distributions K2O | NaCl | W.I. | Calculated Head Grade K2O | NaCl | W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1105 | 1.99 F | 63.30 | 62.45 | 0.59 | 0.56 | 40.42 | 90.61 | 0.44 | 14.23 | 27.86 | 54.31 | 1.59 |
| 1106 | S | 93.30 | 4.39 | 90.76 | 2.29 | 59.58 | 9.39 | 99.56 | 85.77 | | | |
| 1107 | 2.01 F | 56.90 | 62.21 | 1.11 | 0.42 | 41.99 | 93.19 | 0.86 | 11.77 | 28.03 | 54.13 | 1.50 |
| 1108 | S | 78.60 | 3.29 | 92.51 | 2.28 | 58.01 | 6.81 | 99.14 | 88.23 | | | |
| 1109 | 2.03 F | 57.50 | 62.25 | 1.04 | 0.43 | 43.66 | 94.98 | 0.85 | 12.65 | 28.61 | 53.22 | 1.48 |
| 1110 | S | 74.20 | 2.55 | 93.66 | 2.30 | 56.34 | 5.02 | 99.15 | 87.35 | | | |
| 1111 | 2.05 F | 62.10 | 61.78 | 1.67 | 0.54 | 44.58 | 96.99 | 1.39 | 14.56 | 28.40 | 53.40 | 1.65 |
| 1112 | S | 77.20 | 1.54 | 95.01 | 2.55 | 55.42 | 3.01 | 98.61 | 85.44 | | | |
| 1113 | 2.07 F | 59.60 | 61.74 | 1.67 | 0.60 | 44.85 | 97.80 | 1.40 | 15.85 | 28.31 | 53.49 | 1.70 |
| 1114 | S | 73.30 | 1.13 | 95.62 | 2.59 | 55.15 | 2.20 | 98.60 | 84.15 | | | |
| 1115 | 2.10 F | 64.80 | 60.98 | 2.86 | 0.62 | 45.54 | 98.51 | 2.42 | 17.17 | 28.19 | 53.74 | 1.64 |
| 1116 | S | 77.50 | 0.77 | 96.28 | 2.50 | 54.46 | 1.49 | 97.58 | 82.83 | | | |
| 1117 | 2.15 F | 140.20 | 38.84 | 37.90 | 0.62 | 72.79 | 99.33 | 51.89 | 25.45 | 28.46 | 53.17 | 1.77 |
| 1118 | S | 52.40 | 0.70 | 94.03 | 4.86 | 27.21 | 0.67 | 48.11 | 74.55 | | | |
| 1119 | 2.20 F | 392.40 | 28.64 | 53.70 | 0.97 | 96.39 | 99.62 | 95.68 | 45.82 | 27.71 | 54.10 | 2.04 |
| 1120 | S | 14.70 | 2.95 | 64.71 | 30.62 | 3.61 | 0.38 | 4.32 | 54.18 | | | |
| | | | | tom | 39 | | | | | | | |

# APPENDIX 2

## TABLE 1

## SCREEN ANALYSIS AND ASSAY

## DRY SECONDARY CRUSHING SCREEN FEED

| SIZE FRACTION | WT% | CUMM. WT. % | $K_2O$ | W.I. |
|---|---|---|---|---|
| -1/2 +1/4 " | 16.4 | 16.4 | 19.63 | 7.90 |
| -1/4 + 4 Mesh | 10.8 | 27.2 | 18.14 | 7.22 |
| - 4 + 5 | 5.8 | 33.0 | 18.55 | 6.54 |
| - 5 + 6 | 7.5 | 40.5 | 19.49 | 5.88 |
| - 6 + 8 | 16.4 | 56.9 | 22.01 | 5.18 |
| - 8 +10 | 15.5 | 72.4 | 24.07 | 4.44 |
| -10 +14 | 13.8 | 86.2 | 25.47 | 4.32 |
| -14 +20 | 13.6 | 99.8 | 26.49 | 4.34 |
| | | | 22.22 | 5.63 |

## TABLE 2

## SCREEN ANALYSIS AND ASSAY

## NORMAL ROUGHER FEED

| SIZE FRACTION | WT% | CUMM. WT. % | $K_2O$ | W.I. |
|---|---|---|---|---|
| + 6 | 7.8 | 7.8 | 21.66 | 1.05 |
| - 6 + 8 | 29.6 | 37.4 | 25.16 | 1.14 |
| - 8 +10 | 24.7 | 62.1 | 28.09 | 1.05 |
| -10 +14 | 16.1 | 78.2 | 28.96 | 0.95 |
| -14 +20 | 7.7 | 85.9 | 29.74 | 0.97 |
| -20 +28 | 5.0 | 90.9 | 29.72 | 0.89 |
| -28 +35 | 2.8 | 93.7 | 30.09 | 0.77 |
| -35 | 6.3 | 100.0 | 29.66 | 1.13 |
| | | | 27.22 | 1.04 |

LAKEFIELD RESEARCH
A DIVISION OF FALCONBRIDGE LIMITED

PHONE (705) 652-3341
TELEX NO. 06962842
FACSIMILE NO. (705) 652-6365

March 6th, 1987

Mr. A. Cormode
Cominco Chem. & Fertilizers,
Potash Operations,
Vanscoy, Saskatchewan
SOL 3J0

Dear Mr. Cormode:

Please find enclosed three copies of our Progress Report No. 1 on An Investigation of Heavy Media Separation of Potash Ore from Vanscoy submitted by Cominco Limited - Potash Operations.

Best regards.

Yours truly

LAKEFIELD RESEARCH

R.S. Salter
General Manager

RSS:jm

Encl.

185 CONCESSION STREET, P.O. BOX 430 LAKEFIELD, ONTARIO, CANADA K0L 2H0

An Investigation of

# HEAVY MEDIA SEPARATION

of Potash Ore from Vanscoy

submitted by

**COMINCO LIMITED - POTASH OPERATIONS**

Progress Report No. I

Project No. L.R. 3267

NOTE:

This report refers to the samples as received.

The practice of this company in issuing reports of this nature is to require the recipient not to publish the report or any part thereof without the written consent of Lakefield Research.

LAKEFIELD RESEARCH
A Division of Falconbridge Limited
March5, 1987

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| TESTWORK RESULTS | 7 - 15 |

## INTRODUCTION

Mr. Alex Cormode of Cominco Limited - Potash Operations required that Tri-Flo heavy media tests be run on samples of potash ore from their plant in Vanscoy, Saskatchewan. The objective of the Testwork was to reject rock salt and clay to give a high grade potash concentrate in the float product. Messrs. Glen White and Tom Jones of Cominco Limited observed and assisted in the testwork. All assays were done by Cominco Limited in Vanscoy, Saskatchewan.

LAKEFIELD RESEARCH

R.S. Salter

General Manager

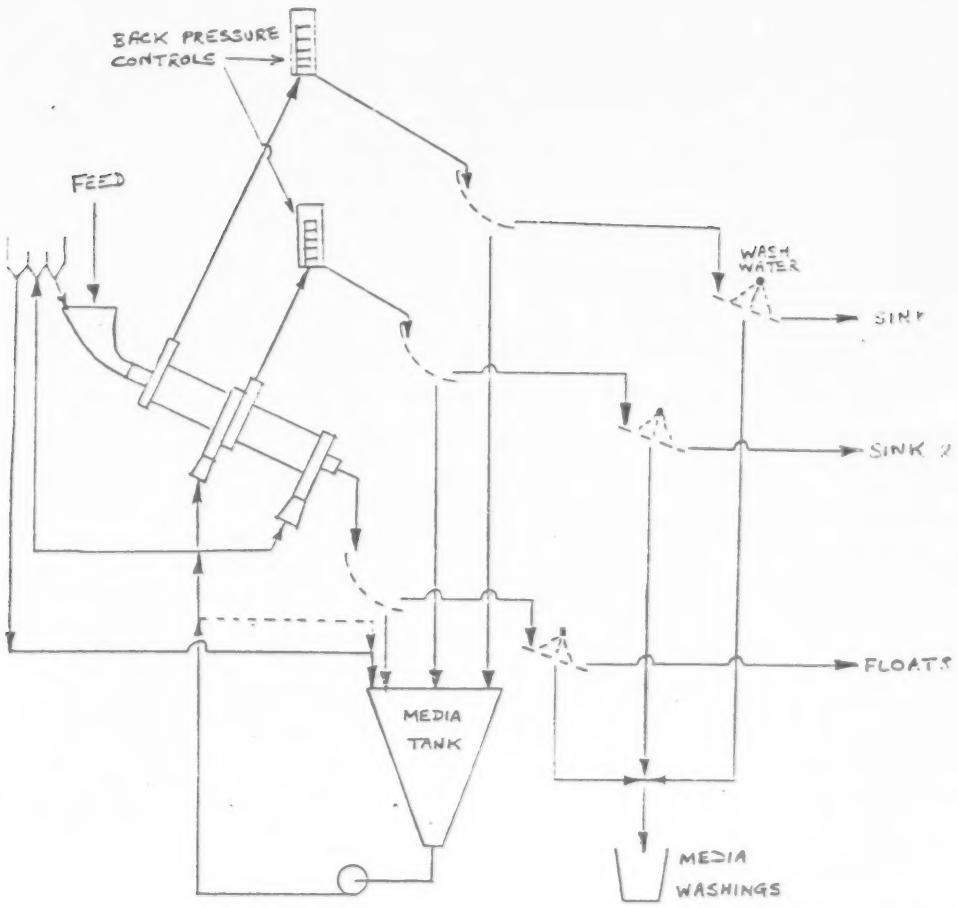
A.C.T. Bigg, P. Eng.

Senior Project Engineer

Experimental Work by: B. Glassford

# SUMMARY

## 1. Circuit and Operation




The Tri-Flo TFS 150 circuit as operated at Lakefield Research is shown in the above diagram. Saturated brine solution provided by Cominco Limited was used in place of water for all stages of the operation. Variables investigated during the testwork were media density and back pressure on the Tri-Flo sink outlets.

Summary - Continued

The media consisted of minus 200 mesh magnetite in saturated brine solution. The initial adjustments to the media density were made whilst recycling the media directly through the tank. Final adjustments and measurements were made with the separator in the circuit. With the media operating as required, approximately 15 kg of minus 6 mesh plus 20 mesh ore was fed into the separator within a time period of 2 to 5 minutes. The oversize products from the DSM screens were collected on secondary screens and washed at leisure with brine solution.

The products were drained and weighed without drying. Smaller samples of each product were then cut and sealed in plastic bags, weighed and shipped to Cominco for drying, reweighing and assaying.

## 2. Feed Samples

The three samples tested are listed below with their average calculated head assays.

| | Assay % | | |
|---|---|---|---|
| | K2O | NaCl | Water Insol. |
| A. Dry Feed - Sec. Crushing Screen Feed | 23.4 | 57.9 | 5.1 |
| B. Normal Rougher Feed | 29.2 | 52.7 | 1.1 |
| C. Lab Scrubbed - Sec. Crushing Screen Feed | 26.1 | 56.3 | 2.4 |

Summary - Continued

## 3. Results

| Test No. | Feed Sample | Media Densities, g/L | | | | | Back Pressure, mm | | Wt % Recovery | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Feed | Sink 1 | Sink 2 | Float | Δ S1-F | S1 | S2 | Sink 1 | Sink 2 | Float |
| 1 | A | 2205 | 2235 | 2275 | 2155 | 80 | 495 | 775 | 2.1 | 2.8 | 95.1 |
| 2 | A | 2165 | 2200 | 2208 | 2050 | 150 | 495 | 775 | 8.4 | 14.7 | 76.9 |
| 3 | A | 2125 | 2183 | 2195 | 2045 | 138 | 495 | 775 | 19.0 | 26.8 | 54.2 |
| 4 | A | 2065 | 2133 | 2135 | 1965 | 168 | 495 | 775 | 49.5 | 22.6 | 28.0 |
| 5 | A | 2060 | 2128 | 2125 | 1958 | 70 | 745 | 775 | 31.9 | 35.2 | 32.9 |
| 6 | A | 1970 | 2045 | 2025 | 1790 | 255 | 495 | 525 | 70.5 | 27.8 | 1.7 |
| 7 | A | 2028 | 2085 | 2085 | 1880 | 205 | 495 | 525 | 57.8 | 28.6 | 13.6 |
| 14 | A | 2035 | 2098 | 2088 | 1858 | 240 | 495 | 525 | 42.9 | 31.5 | 25.6 |
| 8 | B | 2085 | 2145 | 2140 | 1980 | 165 | 495 | 525 | 24.0 | 28.8 | 47.2 |
| 9 | B | 2060 | 2115 | 2108 | 1935 | 180 | 495 | 525 | 33.8 | 24.7 | 41.5 |
| 10 | B | 2033 | 2120 | 2115 | 1905 | 215 | 495 | 525 | 38.6 | 22.4 | 39.1 |
| 11 | B | 2028 | 2100 | 2085 | 1835 | 265 | 495 | 525 | 36.0 | 24.4 | 39.6 |
| 12 | B | 2023 | 2115 | 2070 | 1865 | 250 | 495 | 525 | 32.4 | 29.1 | 38.6 |
| 16 | B | 1998 | 2100 | 2033 | 1860 | 240 | 495 | 525 | 34.7 | 46.4 | 18.9 |
| 17 | B* | 1960 | 2048 | 2015 | 1838 | 210 | 495 | 525 | 33.9 | 32.9 | 33.3 |
| 13 | C | 2035 | 2163 | 2120 | 1920 | 243 | 495 | 525 | 23.2 | 34.3 | 42.5 |
| 15 | C | 2010 | 2113 | 2060 | 1875 | 238 | 495 | 525 | 29.1 | 45.7 | 25.2 |

* clay added with feed.

As can be seen in the test results and Figures 1 - 4 each feed sample has its own separate separation characteristics. The scrubbed feed and normal rougher feed give a much cleaner separation than the dry feed.

The normal rougher feed gave the best results with a grade of 60% $K_2O$ being achievable at 85% recovery whilst rejecting 95% of the NaCl and 80% of the water insoluble material.

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Lakefield, Ontario
March 5, 1987

Fig 1. Dry Feed - Secondary Crushing Screen Feed

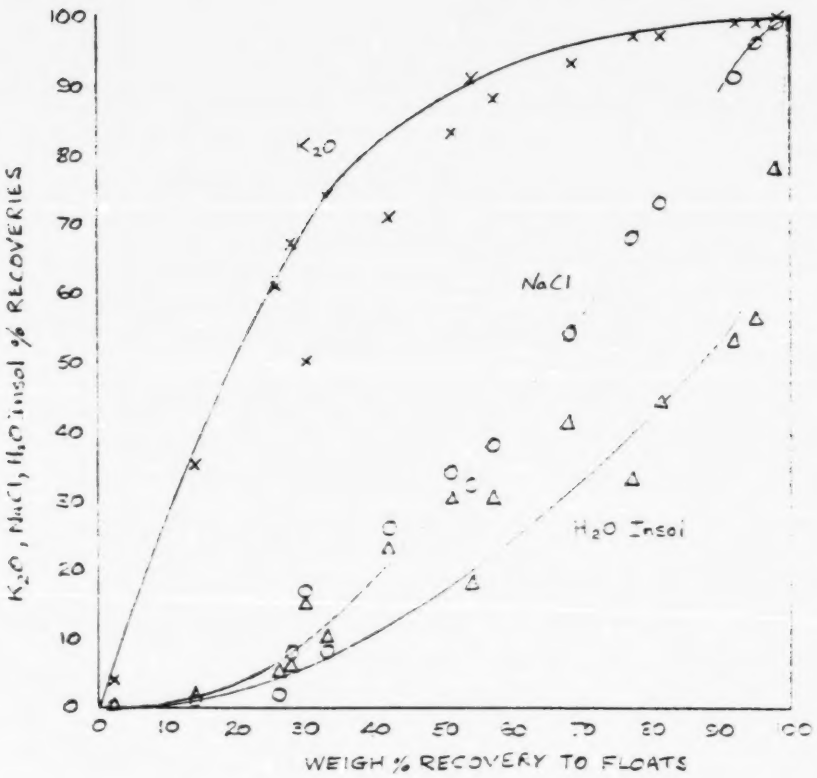



Fig 2. Normal Rougher Feed

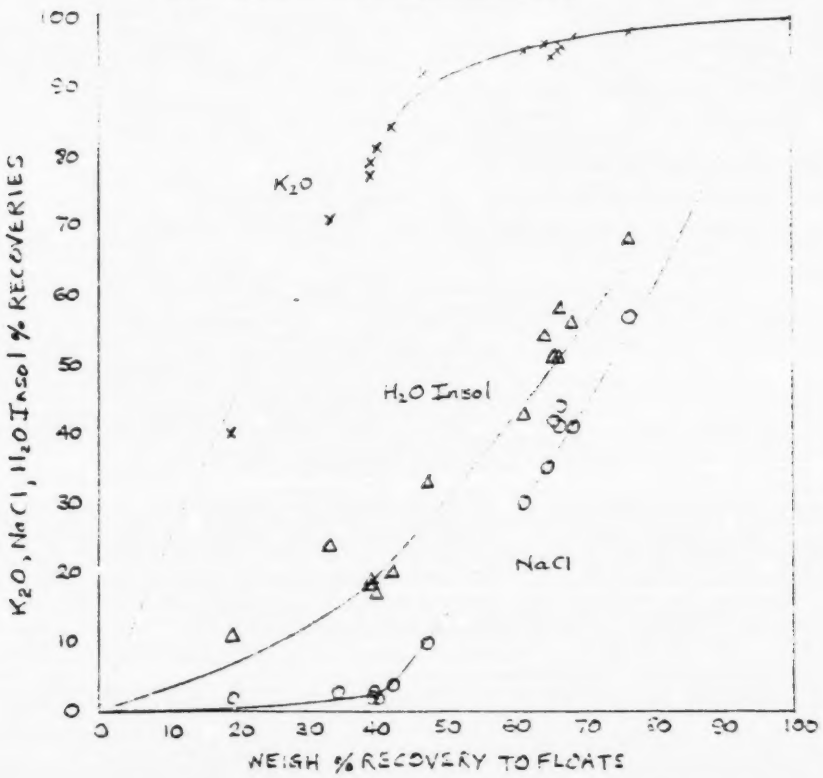


Fig 3 Laboratory Scrubbed Secondary Crushing Screen Feed

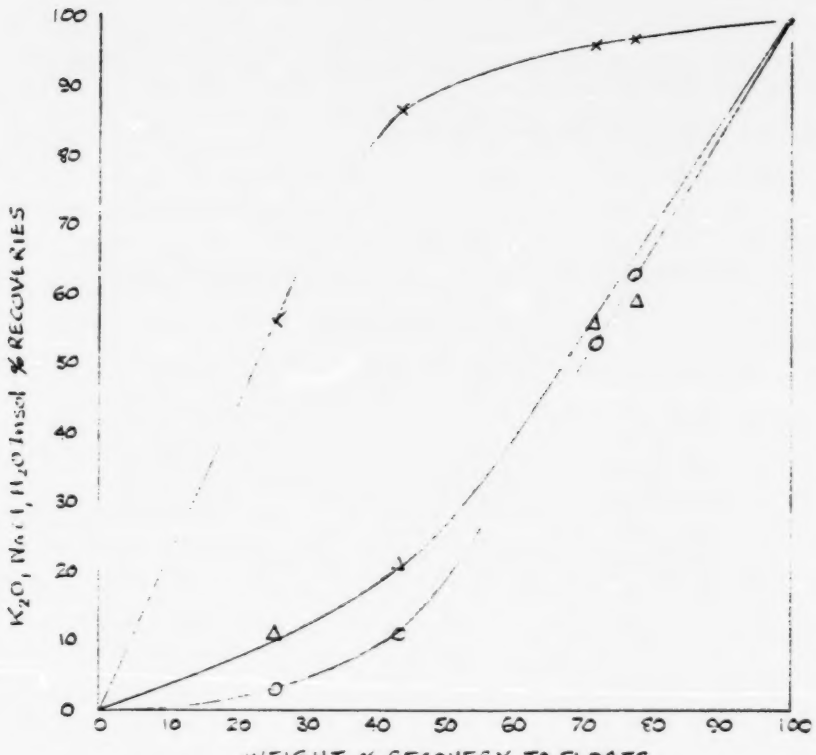
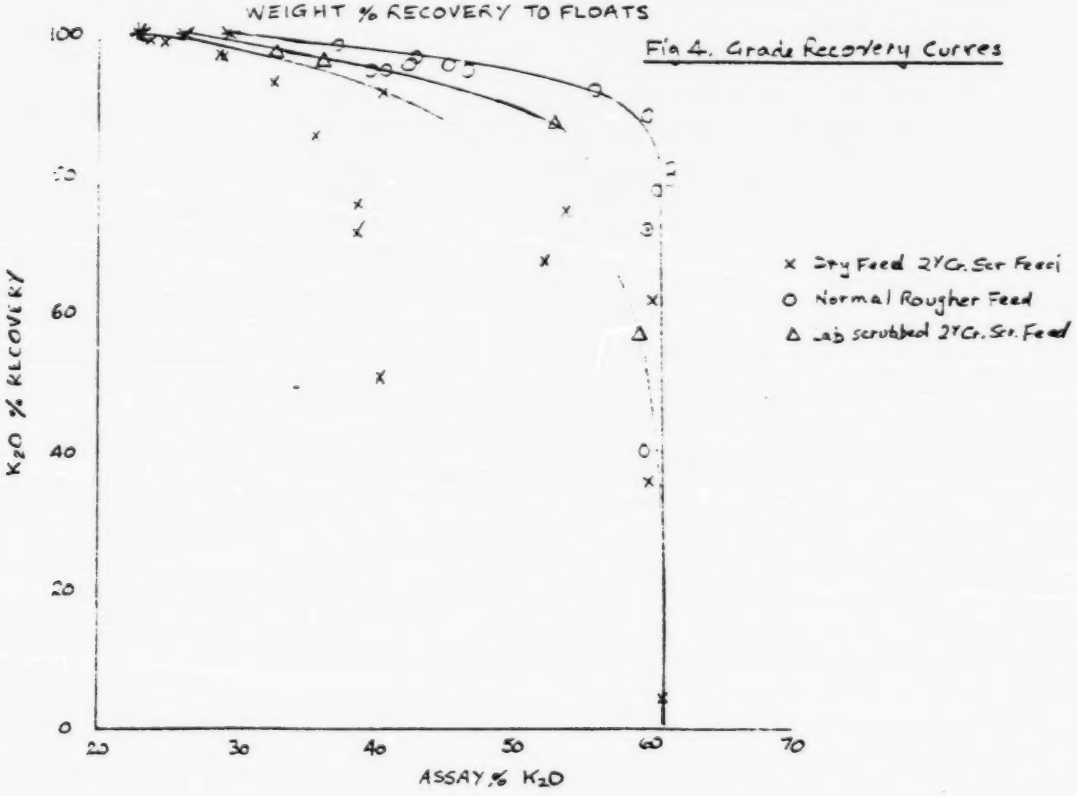



Fig 4. Grade Recovery Curves



TEST NO. 1
SIZE : -6 + 20 Mesh Dry Feed - Secondary Crushing Screen Feed

| PRODUCT | WEIGHT | | ASSAYS % | | | % DISTRIBUTION | | |
|---|---|---|---|---|---|---|---|---|
| | g | % | K2O | NaCl | H2O Insol | K2O | NaCl | H2O Insol |
| Sink 1 | 11662.6 | 2.1 | 2.9 | 42.4 | 53.0 | 0.3 | 1.5 | 22.5 |
| Sink 2 | 253.6 | 2.8 | 3.9 | 55.5 | 38.3 | 0.5 | 2.6 | 21.7 |
| Float | 347.7 | 95.1 | 23.8 | 59.5 | 2.9 | 99.3 | 95.9 | 55.8 |
| Head (Calc.) | 12263.9 | 100.0 | 22.8 | 59.0 | 4.9 | 100.0 | 100.0 | 100.0 |
| COMBINED PRODUCTS | | | | | | | | |
| Sink 1+2 | 11916.2 | 4.9 | 3.5 | 49.9 | 44.6 | 0.7 | 4.1 | 44.2 |
| Sink 2 + Float | 601.3 | 97.9 | 23.2 | 59.4 | 2.9 | 99.7 | 98.5 | 77.5 |

TEST NO. 2
SIZE : -6 + 20 Mesh Dry Feed - Secondary Crushing Screen Feed

| PRODUCT | WEIGHT | | ASSAYS % | | | % DISTRIBUTION | | |
|---|---|---|---|---|---|---|---|---|
| | g | % | K2O | NaCl | H2O Insol | K2O | NaCl | H2O Insol |
| Sink 1 | 1077.8 | 8.4 | 3.8 | 66.3 | 27.6 | 1.4 | 9.5 | 47.5 |
| Sink 2 | 1892.1 | 14.7 | 2.7 | 89.3 | 6.4 | 1.7 | 22.4 | 19.3 |
| Float | 9884.0 | 76.9 | 28.9 | 52.1 | 2.1 | 96.9 | 68.2 | 33.2 |
| Head (Calc.) | 12853.9 | 100.0 | 22.9 | 58.8 | 4.9 | 100.0 | 100.0 | 100.0 |
| COMBINED PRODUCTS | | | | | | | | |
| Sink 1+2 | 2969.9 | 23.1 | 3.1 | 81.0 | 14.1 | 3.1 | 31.8 | 66.3 |
| Sink 2 + Float | 11776.1 | 91.6 | 24.7 | 58.1 | 2.8 | 98.6 | 90.5 | 52.5 |

TEST NO. 3
SIZE : -6 + 20 Mesh Dry Feed - Secondary Crushing Screen Feed

| PRODUCT | WEIGHT | | ASSAYS % | | | % DISTRIBUTION | | |
|---|---|---|---|---|---|---|---|---|
| | g | % | K2O | NaCl | H2O Insol | K2O | NaCl | H2O Insol |
| Sink 1 | 2630.0 | 19.0 | 3.9 | 80.4 | 13.5 | 3.1 | 26.6 | 55.6 |
| Sink 2 | 3713.7 | 26.8 | 4.9 | 87.6 | 4.6 | 5.5 | 40.9 | 26.8 |
| Float | 7513.6 | 54.2 | 40.5 | 34.3 | 1.5 | 91.4 | 32.4 | 17.6 |
| Head (Calc.) | 13857.3 | 100.0 | 24.0 | 57.3 | 4.6 | 100.0 | 100.0 | 100.0 |
| COMBINED PRODUCTS | | | | | | | | |
| Sink 1+2 | 6343.7 | 45.8 | 4.5 | 84.6 | 8.3 | 8.6 | 67.6 | 82.4 |
| Sink 2 + Float | 11227.3 | 81.0 | 28.7 | 51.9 | 2.5 | 96.9 | 73.4 | 44.4 |

TEST NO. 4
SIZE : -6 + 20 Mesh Dry Feed - Secondary Crushing Screen Feed

| PRODUCT | WEIGHT | | ASSAYS % | | | % DISTRIBUTION | | |
|---|---|---|---|---|---|---|---|---|
| | g | % | K20 | NaCl | H20 Insol | K20 | NaCl | H20 Insol |
| Sink 1 | 6966.6 | 49.5 | 7.7 | 80.9 | 6.9 | 17.5 | 65.9 | 70.1 |
| Sink 2 | 3178.6 | 22.6 | 14.8 | 71.6 | 5.1 | 15.4 | 26.6 | 23.6 |
| Float | 3939.9 | 28.0 | 52.2 | 16.3 | 1.1 | 67.1 | 7.5 | 6.3 |
| Head (Calc.) | 14085.1 | 100.0 | 21.7 | 60.7 | 4.9 | 100.0 | 100.0 | 100.0 |
| COMBINED PRODUCTS | | | | | | | | |
| Sink 1+2 | 10145.2 | 72.0 | 9.9 | 78.0 | 6.3 | 32.9 | 92.5 | 93.7 |
| Sink 2 + Float | 7118.5 | 50.5 | 35.5 | 41.0 | 2.9 | 82.5 | 34.1 | 29.9 |

TEST NO. 5
SIZE : -6 + 20 Mesh Dry Feed - Secondary Crushing Screen Feed

| PRODUCT | WEIGHT | | ASSAYS % | | | % DISTRIBUTION | | |
|---|---|---|---|---|---|---|---|---|
| | g | % | K20 | NaCl | H20 Insol | K20 | NaCl | H20 Insol |
| Sink 1 | 5133.3 | 31.9 | 5.3 | 84.7 | 6.9 | 7.1 | 46.0 | 59.0 |
| Sink 2 | 5679.4 | 35.2 | 12.7 | 76.6 | 3.3 | 18.8 | 46.1 | 31.2 |
| Float | 5302.3 | 32.9 | 53.6 | 14.1 | 1.1 | 74.1 | 7.9 | 9.7 |
| Head (Calc.) | 16115.0 | 100.0 | 23.8 | 58.6 | 3.7 | 100.0 | 100.0 | 100.0 |
| COMBINED PRODUCTS | | | | | | | | |
| Sink 1+2 | 10812.7 | 67.1 | 9.2 | 80.4 | 5.0 | 25.9 | 92.1 | 90.3 |
| Sink 2 + Float | 10981.7 | 68.1 | 32.4 | 46.4 | 2.2 | 92.9 | 54.0 | 41.0 |

TEST NO. 6
SIZE : -6 + 20 Mesh Dry Feed - Secondary Crushing Screen Feed

| PRODUCT | WEIGHT | | ASSAYS % | | | % DISTRIBUTION | | |
|---|---|---|---|---|---|---|---|---|
| | g | % | K20 | NaCl | H20 Insol | K20 | NaCl | H20 Insol |
| Sink 1 | 7531.9 | 70.5 | 16.8 | 66.0 | 7.4 | 49.9 | 82.8 | 84.8 |
| Sink 2 | 2970.1 | 27.8 | 39.2 | 34.7 | 3.3 | 45.9 | 17.2 | 14.9 |
| Float | 176.9 | 1.7 | 60.7 | 3.0 | 1.0 | 4.2 | 0.1 | 0.3 |
| Head (Calc.) | 10678.9 | 100.0 | 23.8 | 56.3 | 6.2 | 100.0 | 100.0 | 100.0 |
| COMBINED PRODUCTS | | | | | | | | |
| Sink 1+2 | 10502 | 98.3 | 23.1 | 57.1 | 6.2 | 95.8 | 99.9 | 99.7 |
| Sink 2 + Float | 3147 | 29.5 | 40.4 | 32.9 | 3.2 | 50.1 | 17.2 | 15.2 |

TEST NO. 7
SIZE : -6 + 20 Mesh Dry Feed - Secondary Crushing Screen Feed

| PRODUCT | WEIGHT | | ASSAYS % | | | % DISTRIBUTION | | |
|---|---|---|---|---|---|---|---|---|
| | g | % | K2O | NaCl | H2O Insol | K2O | NaCl | H2O Insol |
| Sink 1 | 5674.2 | 57.8 | 11.5 | 73.3 | 8.5 | 28.9 | 74.0 | 76.6 |
| Sink 2 | 2811.5 | 28.6 | 28.7 | 49.8 | 4.8 | 35.7 | 24.9 | 21.4 |
| Float | 1338.6 | 13.6 | 59.7 | 4.5 | 0.9 | 35.4 | 1.1 | 1.9 |
| Head (Calc.) | 9824.3 | 100.0 | 23.0 | 57.2 | 6.4 | 100.0 | 100.0 | 100.0 |
| COMBINED PRODUCTS | | | | | | | | |
| Sink 1+2 | 8485.7 | 86.4 | 17.2 | 65.5 | 7.3 | 64.6 | 98.9 | 98.1 |
| Sink 2 + Float | 4150.1 | 42.2 | 38.7 | 35.2 | 3.5 | 71.1 | 26.0 | 23.4 |

TEST NO. 14
SIZE : -6 + 20 Mesh Dry Feed - Secondary Crushing Screen Feed

| PRODUCT | WEIGHT | | ASSAYS % | | | % DISTRIBUTION | | |
|---|---|---|---|---|---|---|---|---|
| | g | % | K2O | NaCl | H2O Insol | K2O | NaCl | H2O Insol |
| Sink 1 | 5775.6 | 42.9 | 7.2 | 80.0 | 8.6 | 12.3 | 62.3 | 70.0 |
| Sink 2 | 4238.7 | 31.5 | 21.0 | 62.5 | 4.2 | 26.4 | 35.7 | 25.1 |
| Float | 3449.4 | 25.6 | 59.8 | 4.4 | 1.0 | 61.2 | 2.0 | 4.9 |
| Head (Calc.) | 13463.7 | 100.0 | 25.0 | 55.1 | 5.3 | 100.0 | 100.0 | 100.0 |
| COMBINED PRODUCTS | | | | | | | | |
| Sink 1+2 | 10014.3 | 74.4 | 13.0 | 72.6 | 6.7 | 38.8 | 98.0 | 95.1 |
| Sink 2 + Float | 7688.1 | 57.1 | 38.4 | 36.4 | 2.8 | 87.7 | 37.7 | 30.0 |

TEST NO. 8
SIZE : -6 + 20 Normal Rougher Feed

| PRODUCT | WEIGHT | | ASSAYS % | | | % DISTRIBUTION | | |
|---|---|---|---|---|---|---|---|---|
| | g | % | K20 | NaCl | H20 Insol | K20 | NaCl | H20 Insol |
| Sink 1 | 2556.8 | 24.0 | 2.2 | 95.1 | 1.5 | 1.8 | 42.7 | 31.6 |
| Sink 2 | 3064.1 | 28.8 | 6.3 | 88.6 | 1.4 | 6.3 | 47.7 | 35.3 |
| Float | 5027.5 | 47.2 | 55.9 | 10.8 | 0.8 | 91.9 | 9.5 | 33.1 |
| Head (Calc.) | 10648.4 | 100.0 | 28.7 | 53.4 | 1.1 | 100.0 | 100.0 | 100.0 |
| COMBINED PRODUCTS | | | | | | | | |
| Sink 1+2 | 5620.9 | 52.8 | 4.4 | 91.6 | 1.4 | 8.1 | 90.5 | 66.9 |
| Sink 2 + Float | 8091.6 | 76.0 | 37.1 | 40.3 | 1.0 | 98.2 | 57.3 | 68.4 |

TEST NO. 9
SIZE : -6 + 20 Normal Rougher Feed

| PRODUCT | WEIGHT | | ASSAYS % | | | % DISTRIBUTION | | |
|---|---|---|---|---|---|---|---|---|
| | g | % | K20 | NaCl | H20 Insol | K20 | NaCl | H20 Insol |
| Sink 1 | 3370.5 | 33.8 | 3.9 | 92.4 | 1.5 | 4.5 | 59.5 | 48.9 |
| Sink 2 | 2469.3 | 24.7 | 13.6 | 77.2 | 1.3 | 11.4 | 36.4 | 31.1 |
| Float | 4138.1 | 41.5 | 59.6 | 5.2 | 0.5 | 84.1 | 4.1 | 20.0 |
| Head (Calc.) | 9977.9 | 100.0 | 29.4 | 52.5 | 1.0 | 100.0 | 100.0 | 100.0 |
| COMBINED PRODUCTS | | | | | | | | |
| Sink 1+2 | 5839.8 | 58.5 | 8.0 | 86.0 | 1.4 | 15.9 | 95.9 | 80.0 |
| Sink 2 + Float | 6607.4 | 66.2 | 42.4 | 32.1 | 0.8 | 95.5 | 40.5 | 51.1 |

TEST NO. 10
SIZE : -6 + 20 Normal Rougher Feed

| PRODUCT | WEIGHT | | ASSAYS % | | | % DISTRIBUTION | | |
|---|---|---|---|---|---|---|---|---|
| | g | % | K20 | NaCl | H20 Insol | K20 | NaCl | H20 Insol |
| Sink 1 | 3419.7 | 38.6 | 4.0 | 92.1 | 1.6 | 5.1 | 69.6 | 57.1 |
| Sink 2 | 1982.5 | 22.4 | 21.5 | 64.8 | 1.2 | 15.9 | 28.4 | 24.8 |
| Float | 3465.2 | 39.1 | 61.2 | 2.7 | 0.5 | 79.0 | 2.1 | 18.1 |
| Head (Calc.) | 8867.4 | 100.0 | 30.3 | 51.1 | 1.1 | 100.0 | 100.0 | 100.0 |
| COMBINED PRODUCTS | | | | | | | | |
| Sink 1+2 | 5402.2 | 60.9 | 10.4 | 82.1 | 1.5 | 21.0 | 97.9 | 81.9 |
| Sink 2 + Float | 5447.7 | 61.4 | 46.8 | 25.3 | 0.8 | 94.9 | 30.4 | 42.9 |

TEST NO. 11
SIZE : -6 + 20 Normal Rougher Feed

| PRODUCT | WEIGHT | | ASSAYS % | | | % DISTRIBUTION | | |
|---|---|---|---|---|---|---|---|---|
| | g | % | K20 | NaCl | H20 Insol | K20 | NaCl | H20 Insol |
| Sink 1 | 3858.8 | 36.0 | 3.5 | 93.0 | 1.5 | 4.2 | 65.5 | 45.9 |
| Sink 2 | 2614.2 | 24.4 | 19.0 | 68.2 | 1.8 | 15.4 | 32.5 | 37.3 |
| Float | 4243.3 | 39.6 | 61.3 | 2.5 | 0.5 | 80.5 | 1.9 | 16.8 |
| Head (Calc.) | 10716.3 | 100.0 | 30.2 | 51.1 | 1.2 | 100.0 | 100.0 | 100.0 |
| COMBINED PRODUCTS | | | | | | | | |
| Sink 1+2 | 6473 | 60.4 | 9.8 | 83.0 | 1.6 | 19.5 | 98.1 | 83.2 |
| Sink 2 + Float | 6857.5 | 64.0 | 45.2 | 27.5 | 1.0 | 95.8 | 34.5 | 54.1 |

TEST NO. 12
SIZE : -6 + 20 Normal Rougher Feed

| PRODUCT | WEIGHT | | ASSAYS % | | | % DISTRIBUTION | | |
|---|---|---|---|---|---|---|---|---|
| | g | % | K20 | NaCl | H20 Insol | K20 | NaCl | H20 Insol |
| Sink 1 | 3280.5 | 32.4 | 2.9 | 93.8 | 1.6 | 3.1 | 59.2 | 43.7 |
| Sink 2 | 2945.1 | 29.1 | 20.2 | 66.5 | 1.5 | 19.6 | 37.7 | 36.8 |
| Float | 3907.8 | 38.6 | 60.2 | 4.1 | 0.6 | 77.3 | 3.1 | 19.5 |
| Head (Calc.) | 10133.4 | 100.0 | 30.0 | 51.3 | 1.2 | 100.0 | 100.0 | 100.0 |
| COMBINED PRODUCTS | | | | | | | | |
| Sink 1+2 | 6225.6 | 61.4 | 11.1 | 80.9 | 1.6 | 22.7 | 96.9 | 80.5 |
| Sink 2 + Float | 6852.9 | 67.6 | 43.0 | 30.9 | 1.0 | 96.9 | 40.8 | 56.3 |

TEST NO. 16
SIZE : -6 + 20 Normal Rougher Feed

| PRODUCT | WEIGHT | | ASSAYS % | | | % DISTRIBUTION | | |
|---|---|---|---|---|---|---|---|---|
| | g | % | K20 | NaCl | H20 Insol | K20 | NaCl | H20 Insol |
| Sink 1 | 4550.8 | 34.7 | 4.5 | 91.5 | 1.5 | 5.6 | 58.2 | 49.5 |
| Sink 2 | 6093.4 | 46.4 | 32.9 | 47.0 | 0.9 | 54.4 | 40.0 | 39.7 |
| Float | 2480.1 | 18.9 | 59.5 | 5.3 | 0.6 | 40.0 | 1.8 | 10.8 |
| Head (Calc.) | 13124.3 | 100.0 | 28.1 | 54.6 | 1.1 | 100.0 | 100.0 | 100.0 |
| COMBINED PRODUCTS | | | | | | | | |
| Sink 1+2 | 10644.2 | 81.1 | 20.8 | 66.0 | 1.2 | 60.0 | 98.2 | 89.2 |
| Sink 2 + Float | 8573.5 | 65.3 | 40.6 | 34.9 | 0.8 | 94.4 | 41.8 | 50.5 |

TEST NO. 17
SIZE : -6 + 20 Normal Rougher Feed

| PRODUCT | WEIGHT | | ASSAYS % | | | % DISTRIBUTION | | |
|---|---|---|---|---|---|---|---|---|
| | g | % | K2O | NaCl | H2O Insol | K2O | NaCl | H2O Insol |
| Sink 1 | 4900.6 | 33.9 | 4.5 | 91.4 | 1.4 | 5.5 | 56.4 | 41.8 |
| Sink 2 | 4753.6 | 32.9 | 19.5 | 68.0 | 1.2 | 23.1 | 40.7 | 34.7 |
| Float | 4816.1 | 33.3 | 59.6 | 4.9 | 0.8 | 71.4 | 3.0 | 23.5 |
| Head (Calc.) | 14470.3 | 100.0 | 27.8 | 54.9 | 1.1 | 100.0 | 100.0 | 100.0 |
| COMBINED PRODUCTS | | | | | | | | |
| Sink 1+2 | 9654.2 | 66.7 | 11.9 | 79.9 | 1.3 | 28.6 | 97.0 | 76.5 |
| Sink 2 + Float | 9569.7 | 66.1 | 39.7 | 36.2 | 1.0 | 94.5 | 43.6 | 58.2 |

TEST NO. 13
SIZE : -6 + 20 Laboratory Scrubbed Secondary Crushing Screen Feed

| PRODUCT | WEIGHT | | ASSAYS % | | | % DISTRIBUTION | | |
|---|---|---|---|---|---|---|---|---|
| | g | % | K20 | NaCl | H20 Insol | K20 | NaCl | H20 Insol |
| Sink 1 | 3674.5 | 23.2 | 3.0 | 91.0 | 4.3 | 2.7 | 37.1 | 41.0 |
| Sink 2 | 5428.2 | 34.3 | 7.6 | 85.4 | 2.7 | 10.1 | 51.5 | 38.0 |
| Float | 6728.0 | 42.5 | 52.8 | 15.2 | 1.2 | 87.2 | 11.4 | 21.0 |
| Head (Calc.) | 15830.7 | 100.0 | 25.7 | 56.9 | 2.4 | 100.0 | 100.0 | 100.0 |
| COMBINED PRODUCTS | | | | | | | | |
| Sink 1+2 | 9102.7 | 57.5 | 5.7 | 87.7 | 3.3 | 12.8 | 88.6 | 79.0 |
| Sink 2 + Float | 12156.2 | 76.8 | 32.6 | 46.5 | 1.9 | 97.3 | 62.9 | 59.0 |

TEST NO. 15
SIZE : -6 + 20 Laboratory Scrubbed Secondary Crushing Screen Feed

| PRODUCT | WEIGHT | | ASSAYS % | | | % DISTRIBUTION | | |
|---|---|---|---|---|---|---|---|---|
| | g | % | K20 | NaCl | H20 Insol | K20 | NaCl | H20 Insol |
| Sink 1 | 3149.0 | 29.1 | 3.7 | 90.6 | 3.5 | 4.1 | 47.3 | 43.8 |
| Sink 2 | 4952.0 | 45.7 | 23.1 | 61.1 | 2.2 | 39.8 | 50.2 | 45.3 |
| Float | 2725.8 | 25.2 | 59.1 | 5.5 | 1.0 | 56.1 | 2.5 | 10.8 |
| Head (Calc.) | 10826.8 | 100.0 | 26.5 | 55.7 | 2.3 | 100.0 | 100.0 | 100.0 |
| COMBINED PRODUCTS | | | | | | | | |
| Sink 1+2 | 8101 | 74.8 | 15.6 | 72.6 | 2.8 | 43.9 | 97.5 | 89.2 |
| Sink 2 + Float | 7677.8 | 70.9 | 35.9 | 41.4 | 1.8 | 95.9 | 52.7 | 56.2 |

# APPENDIX 3

LAKEFIELD PILOT TESTWORK RESULTS

MATERIAL: DRY FEED - SEC. CRUSHING SCREEN FEED

| TEST | MEDIA S.G. | SAMPLE # | WEIGHT (gms) | WEIGHT (%) | GRADE (%) K2O | GRADE (%) NaCl | GRADE (%) W.I. | RECOVERY (%) K2O | RECOVERY (%) NaCl | RECOVERY (%) W.I. | CALC. HEAD K2O | CALC. HEAD NaCl | CALC. HEAD W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.205 | FLOAT | 11662.6 | 95.1 | 23.8 | 59.5 | 2.9 | 99.2 | 95.9 | 55.5 | 22.8 | 59.0 | 4.9 |
| | | S1 | 253.6 | 2.1 | 2.9 | 42.4 | 53.0 | 0.3 | 1.5 | 22.4 | | | |
| | | S2 | 347.7 | 2.8 | 3.9 | 55.5 | 38.3 | 0.5 | 2.7 | 22.1 | | | |
| | | | 12263.9 | | | | | | | | | | |
| | 2.165 | FLOAT | 9884.0 | 76.9 | 28.9 | 52.1 | 2.1 | 96.9 | 68.2 | 33.1 | 23.0 | 58.8 | 4.9 |
| | | S1 | 1077.8 | 8.4 | 3.8 | 66.3 | 27.6 | 1.4 | 9.5 | 47.5 | | | |
| | | S2 | 1892.1 | 14.7 | 3.7 | 85.3 | 6.4 | 1.7 | 22.4 | 19.4 | | | |
| | | | 12853.9 | | | | | | | | | | |
| | 2.125 | FLOAT | 7513.6 | 54.2 | 40.5 | 34.3 | 1.5 | 91.5 | 32.5 | 17.6 | 24.0 | 57.4 | 4.6 |
| | | S1 | 2630.0 | 19.0 | 3.9 | 80.4 | 13.5 | 3.0 | 26.6 | 55.5 | | | |
| | | S2 | 3713.7 | 26.8 | 4.9 | 87.6 | 4.6 | 5.5 | 40.9 | 26.8 | | | |
| | | | 13857.3 | | | | | | | | | | |
| 4 | 2.065 | FLOAT | 3939.9 | 28.0 | 52.2 | 16.3 | 1.1 | 67.2 | 7.5 | 6.1 | 21.7 | 60.7 | 4.9 |
| | | S1 | 6966.6 | 49.5 | 7.7 | 80.9 | 6.9 | 17.5 | 65.9 | 70.5 | | | |
| | | S2 | 3178.6 | 22.6 | 14.8 | 71.6 | 5.1 | 15.3 | 26.6 | 23.4 | | | |
| | | | 14085.1 | | | | | | | | | | |
| 5 | 2.060 | FLOAT | 5302.3 | 32.9 | 53.6 | 14.1 | 1.1 | 74.1 | 7.9 | 9.3 | 23.8 | 58.6 | 3.7 |
| | | S1 | 5133.3 | 31.9 | 5.3 | 84.7 | 6.9 | 7.1 | 46.0 | 59.4 | | | |
| | | S2 | 5679.4 | 35.2 | 12.7 | 76.6 | 3.3 | 18.8 | 46.1 | 31.3 | | | |
| | | | 16115.0 | | | | | | | | | | |
| 14 | 2.035 | FLOAT | 3449.4 | 25.6 | 59.6 | 4.4 | 1.0 | 61.2 | 2.0 | 4.7 | 25.0 | 55.1 | 5.3 |
| | | S1 | 5775.6 | 42.9 | 7.2 | 80.0 | 8.6 | 12.3 | 62.3 | 70.0 | | | |
| | | S2 | 4238.7 | 31.5 | 21.0 | 62.5 | 4.2 | 26.4 | 35.7 | 25.4 | | | |
| | | | 13463.7 | | | | | | | | | | |
| | 2.020 | FLOAT | 1338.6 | 13.6 | 59.7 | 4.5 | 0.9 | 35.4 | 1.1 | 2.0 | 23.0 | 57.2 | 6.4 |
| | | S1 | 5674.2 | 57.8 | 11.5 | 73.3 | 8.5 | 29.0 | 74.0 | 76.4 | | | |
| | | S2 | 2811.5 | 28.6 | 28.7 | 49.8 | 4.8 | 35.7 | 24.9 | 21.6 | | | |
| | | | 9824.3 | | | | | | | | | | |
| | 1.970 | FLOAT | 176.9 | 1.7 | 60.7 | 3.0 | 1.0 | 4.2 | 0.1 | 0.3 | 23.8 | 56.2 | 6.2 |
| | | S1 | 7531.9 | 70.5 | 16.6 | 66.0 | 7.4 | 49.9 | 82.8 | 85.0 | | | |
| | | S2 | 2970.1 | 27.8 | 39.2 | 34.7 | 3.3 | 45.9 | 17.2 | 14.7 | | | |
| | | | 10678.9 | | | | | | | | | | |

LAKEFIELD PILOT TESTWORK RESULTS

MATERIAL: NORMAL ROUGHER FEED

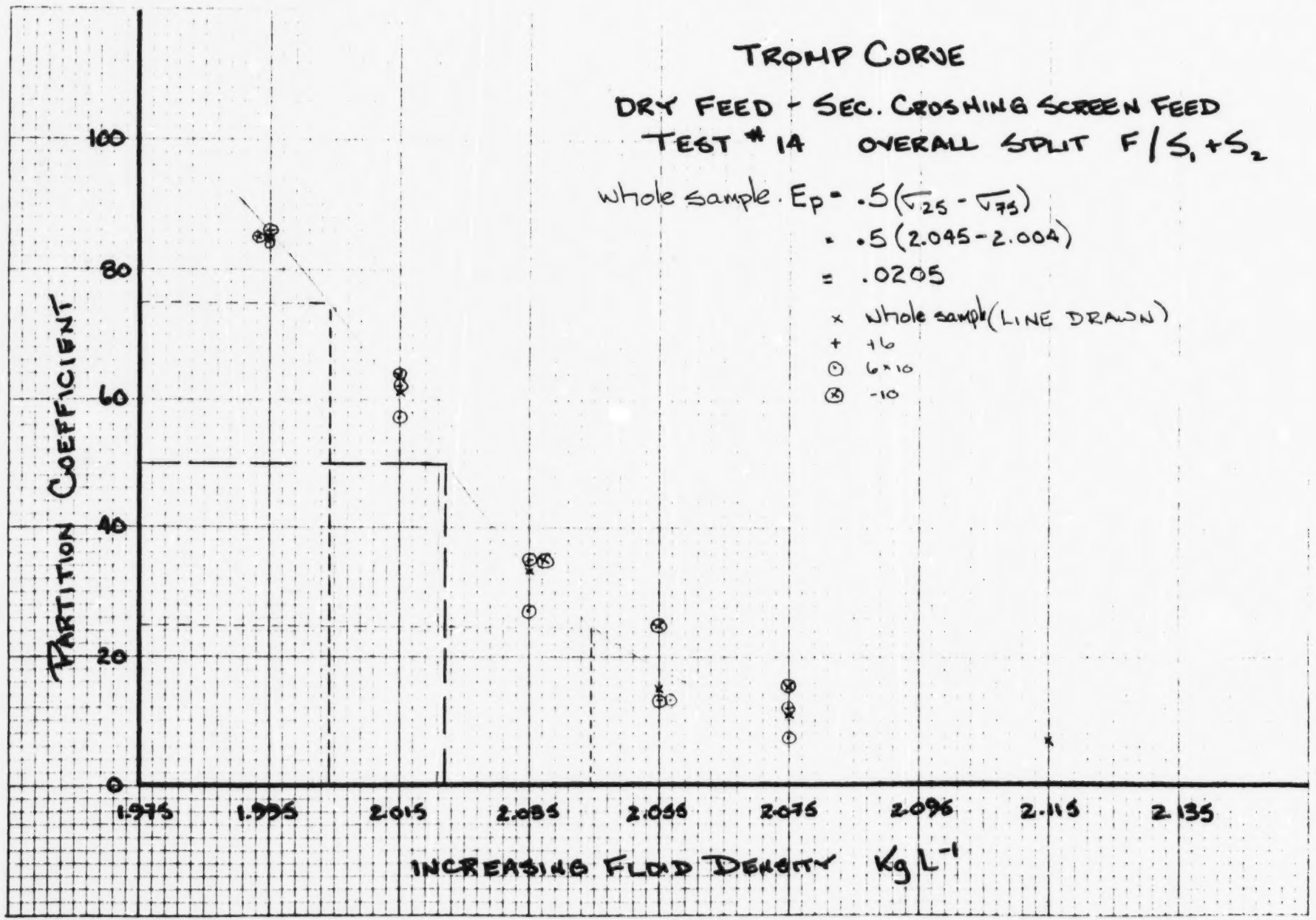
| TEST | MEDIA S.G. | SAMPLE # | WEIGHT (gms) | WEIGHT (%) | GRADE (%) K2O | GRADE (%) NaCl | GRADE (%) W.I. | RECOVERY (%) K2O | RECOVERY (%) NaCl | RECOVERY (%) W.I. | CALC. HEAD K2O | CALC. HEAD NaCl | CALC. HEAD W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | 2.085 | FLOAT | 5027.5 | 47.2 | 55.9 | 10.8 | 0.8 | 91.8 | 9.5 | 32.7 | 28.7 | 53.4 | 1.1 |
| | | S1 | 2556.8 | 24.0 | 2.2 | 95.1 | 1.5 | 1.8 | 42.7 | 30.9 | | | |
| | | S2 | 3064.1 | 28.8 | 6.3 | 88.6 | 1.4 | 6.3 | 47.7 | 36.5 | | | |
| | | | 10648.4 | | | | | | | | | | |
| | 2.060 | FLOAT | 4138.1 | 41.5 | 59.6 | 5.2 | 0.5 | 84.1 | 4.1 | 20.3 | 29.4 | 52.4 | 1.0 |
| | | S1 | 3370.5 | 33.8 | 3.9 | 92.4 | 1.5 | 4.4 | 59.5 | 46.7 | | | |
| | | S2 | 2469.3 | 24.7 | 13.6 | 77.2 | 1.3 | 11.5 | 36.4 | 30.9 | | | |
| | | | 9977.9 | | | | | | | | | | |
| | 2.033 | FLOAT | 3465.2 | 39.1 | 61.2 | 2.7 | 0.5 | 79.0 | 2.0 | 18.5 | 30.7 | 51.0 | 1.1 |
| | | S1 | 3419.7 | 38.6 | 4.0 | 92.1 | 1.6 | 5.1 | 69.6 | 55.9 | | | |
| | | S2 | 1982.5 | 22.4 | 21.5 | 64.8 | 1.2 | 15.9 | 28.4 | 25.6 | | | |
| | | | 8867.4 | | | | | | | | | | |
| 11 | 2.028 | FLOAT | 4243.3 | 39.6 | 61.3 | 2.5 | 0.5 | 80.5 | 1.9 | 16.7 | 30.1 | 51.1 | 1.2 |
| | | S1 | 3858.8 | 36.0 | 3.5 | 93.0 | 1.5 | 4.2 | 65.5 | 46.1 | | | |
| | | S2 | 2614.2 | 24.4 | 19.0 | 68.2 | 1.8 | 15.3 | 32.6 | 37.2 | | | |
| | | | 10716.3 | | | | | | | | | | |
| 12 | 2.025 | FLOAT | 3907.8 | 38.6 | 60.2 | 4.1 | 0.6 | 77.3 | 3.1 | 19.8 | 30.0 | 51.3 | 1.2 |
| | | S1 | 3280.5 | 32.4 | 2.9 | 93.8 | 1.6 | 3.1 | 59.2 | 47.4 | | | |
| | | S2 | 2945.1 | 29.1 | 20.2 | 66.5 | 1.5 | 19.6 | 37.7 | 32.8 | | | |
| | | | 10133.4 | | | | | | | | | | |
| 16 | 1.998 | FLOAT | 2480.1 | 18.9 | 59.5 | 5.3 | 0.6 | 40.1 | 1.8 | 10.9 | 28.0 | 54.5 | 1.1 |
| | | S1 | 4550.8 | 34.7 | 4.5 | 91.5 | 1.5 | 5.5 | 58.2 | 48.5 | | | |
| | | S2 | 6093.4 | 46.4 | 22.9 | 47.0 | 0.9 | 54.4 | 40.0 | 40.7 | | | |
| | | | 13124.3 | | | | | | | | | | |
| | 1.960 | FLOAT | 4816.1 | 33.3 | 59.6 | 4.9 | 0.8 | 71.4 | 3.0 | 24.3 | 27.8 | 54.9 | 1.1 |
| | | S1 | 4900.6 | 33.9 | 4.5 | 91.4 | 1.4 | 5.5 | 56.4 | 42.4 | | | |
| | | S2 | 4753.6 | 32.9 | 19.5 | 68.0 | 1.2 | 23.1 | 40.6 | 33.3 | | | |
| | | | 14470.3 | | | | | | | | | | |

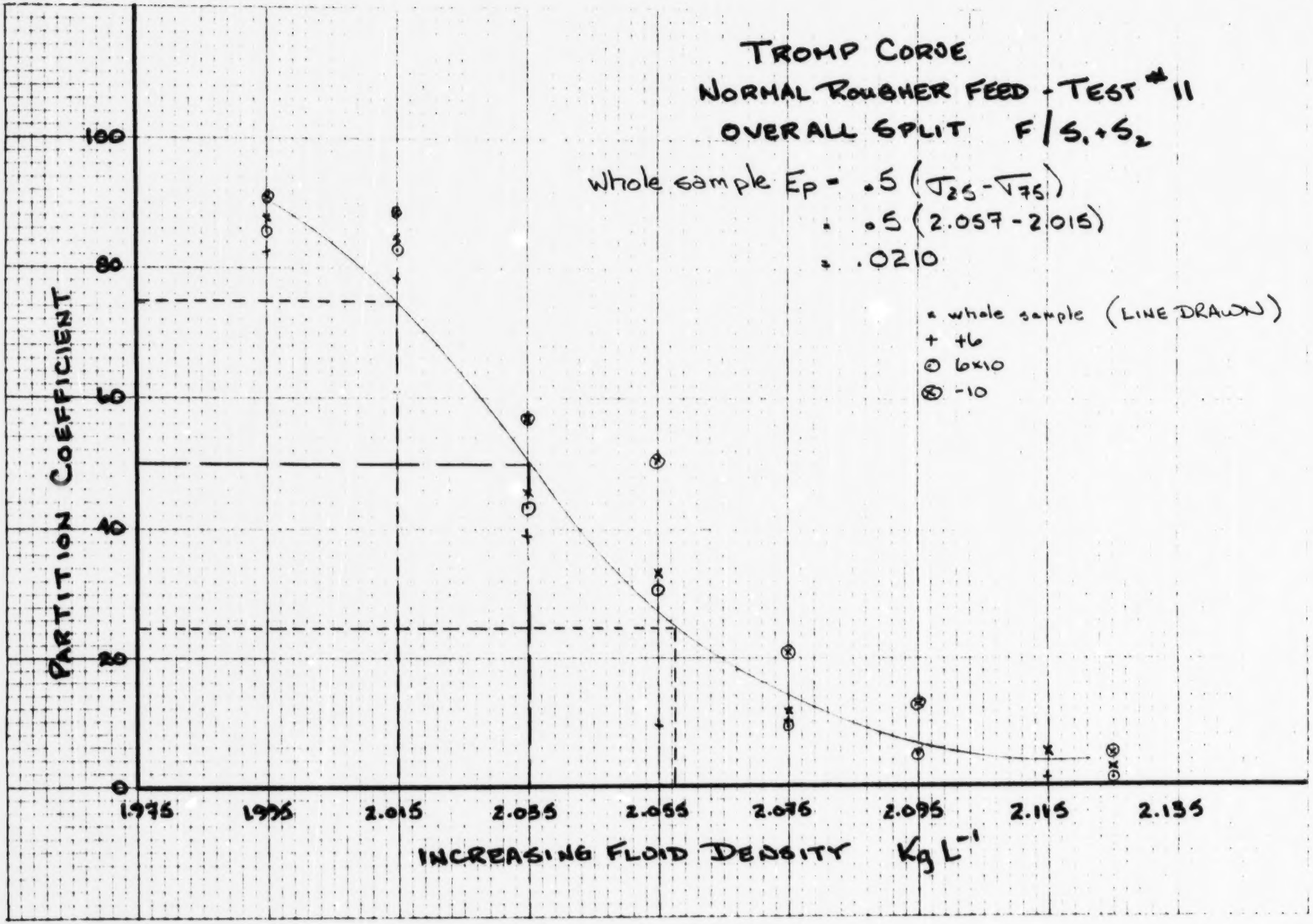
LAKEFIELD PILOT TESTWORK RESULTS

MATERIAL: LAB SCRUBBED SEC CRUSHING SCREEN FEED

| TEST | MEDIA S.G. | SAMPLE # | WEIGHT (gms) | WEIGHT (%) | GRADE (%) KCl | GRADE (%) NaCl | GRADE (%) W.I. | RECOVERY (%) KCl | RECOVERY (%) NaCl | RECOVERY (%) W.I. | CALC. HEAD KCl | CALC. HEAD NaCl | CALC. HEAD W.I. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00 | 2.035 | FLOAT | 6728.0 | 42.5 | 52.8 | 15.2 | 1.2 | 87.3 | 11.4 | 21.1 | 25.7 | 56.9 | 2.4 |
| | | S1 | 3674.5 | 23.2 | 3.0 | 91.0 | 4.3 | 2.7 | 37.1 | 41.1 | | | |
| | | S2 | 5428.2 | 34.3 | 7.6 | 85.4 | 2.7 | 10.1 | 51.5 | 37.8 | | | |
| | | | 15830.7 | | | | | | | | | | |
| 05 | 2.010 | FLOAT | 2725.8 | 25.2 | 59.1 | 5.5 | 1.0 | 56.1 | 2.5 | 11.0 | 26.5 | 55.7 | 2.3 |
| | | S1 | 3149.0 | 29.1 | 3.7 | 90.6 | 3.5 | 4.1 | 47.3 | 44.0 | | | |
| | | S2 | 4952.0 | 45.7 | 23.1 | 61.1 | 2.7 | 39.8 | 50.2 | 45.0 | | | |
| | | | 10826.8 | | | | | | | | | | |

# APPENDIX 4


TROMP CORVE
DRY FEED - SEC. CROSHING SCREEN FEED
TEST # 14 OVERALL SPLIT F/S1+S2
whole sample. Ep = .5(√.25 - √.75)
= .5(2.045 - 2.004)
= .0205
× whole sample (LINE DRAWN)
+ +16
⊙ 6×10
⊗ -10
PARTITION COEFFICIENT
100
80
60
40
20
0
1.975
1.995
2.015
2.035
2.055
2.075
2.095
2.115
2.135
INCREASING FLOAT DENSITY Kg L-1


TROMP CURVE
NORMAL ROUGHER FEED - TEST #11
OVERALL SPLIT F/S1+S2
Whole sample Ep = .5 (J25 - J75)
= .5 (2.057 - 2.015)
= .0210
* whole sample (LINE DRAWN)
+ +6
⊙ 6x10
⊗ -10
PARTITION COEFFICIENT
100
80
60
40
20
0
1.975
1.995
2.015
2.035
2.055
2.075
2.095
2.115
2.135
INCREASING FLOID DENSITY Kg L-1

TEST # 11

| | | (%) |
|---|---|---|
| PRODUCT WT. FRACTION | F | 39.6 |
| | S2 | 24.4 |
| Whole sample | S1 | 36.0 |

| S.G. mean | WEIGHT FLOAT F | WEIGHT MIDDLINGS S2 | WEIGHT TAILS S1 | UNITS F | UNITS S2 | UNITS S1 | DISTRIBUTION F | DISTRIBUTION S2 | DISTRIBUTION S1 |
|---|---|---|---|---|---|---|---|---|---|
| 1.995 | 891.9 | 200.9 | 3.4 | 3531924.0 | 490196.0 | 12240.0 | 87.5 | 12.2 | 0.3 |
| 2.015 | 111.9 | 30.6 | 1.8 | 443124.0 | 74664.0 | 6480.0 | 84.5 | 14.2 | 1.2 |
| 2.035 | 21.6 | 38.1 | 2.3 | 85536.0 | 92964.0 | 8280.0 | 45.8 | 49.8 | 4.4 |
| 2.055 | 12.9 | 36.3 | 4.3 | 51084.0 | 88572.0 | 15480.0 | 32.9 | 57.1 | 10.0 |
| 2.075 | 4.3 | 34.8 | 12.0 | 17028.0 | 84912.0 | 43200.0 | 11.7 | 58.5 | 29.8 |
| 2.095 | 2.8 | 39.5 | 22.9 | 11088.0 | 96380.0 | 82440.0 | 5.8 | 50.8 | 43.4 |
| 2.125 | 1.0 | 32.9 | 28.3 | 3960.0 | 80276.0 | 101880.0 | 2.1 | 43.1 | 54.7 |
| 2.155 | 0.0 | 122.7 | 103.1 | 0.0 | 299388.0 | 371160.0 | 0.0 | 44.6 | 55.4 |
| 2.185 | 0.0 | 643.1 | 823.8 | 0.0 | 1569164.0 | 2965680.0 | 0.0 | 34.6 | 65.4 |
| SINK | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | | | |
| wt.% of | 100.0 | 100.0 | 100.0 | | | | | | |

TEST # 11

| | | (%) |
|---|---|---|
| PRODUCT WT. FRACTION | F | 39.6 |
| | S2 | 24.4 |
| 6x10 MESH MATERIAL | S1 | 36 |

| S.G. mean (g/ml) | WEIGHT OF S.G. FRACTION (g) F | S2 | S1 | UNITS F | S2 | S1 | COMPLETE DISTRIBUTION OF 6x10 MESH MATERIAL (%) F | S2 | S1 | TOT | S.G. FRACTION DISTRIBUTION (%) F | S2 | S1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.995 | 891.9 | 200.9 | 3.4 | 1878984 | 303431 | 5251 | 28.3 | 4.6 | 0.1 | 32.9 | 85.9 | 13.9 | 0.2 |
| 2.015 | 111.9 | 30.6 | 1.8 | 240173 | 47113 | 2877 | 3.6 | 0.7 | 0.0 | 4.4 | 82.8 | 16.2 | 1.0 |
| 2.035 | 21.6 | 38.1 | 2.3 | 51920 | 63773 | 5266 | 0.8 | 1.0 | 0.1 | 1.8 | 42.9 | 52.7 | 4.4 |
| 2.055 | 12.9 | 36.3 | 4.3 | 32030 | 60849 | 11161 | 0.5 | 0.9 | 0.2 | 1.6 | 30.8 | 58.5 | 10.7 |
| 2.075 | 4.3 | 34.8 | 12 | 9723 | 58419 | 30370 | 0.1 | 0.9 | 0.5 | 1.5 | 9.9 | 59.3 | 30.8 |
| 2.015 | 2.8 | 39.5 | 22.9 | 6730 | 65828 | 58697 | 0.1 | 1.0 | 0.9 | 2.0 | 5.1 | 50.2 | 44.7 |
| 2.125 | 1 | 32.9 | 28.3 | 2202 | 53705 | 70603 | 0.0 | 0.8 | 1.1 | 1.9 | 1.7 | 42.5 | 55.8 |
| 2.155 | 0 | 122.7 | 103.1 | 0 | 163466 | 255729 | 0.0 | 2.5 | 3.8 | 6.3 | 0.0 | 39.0 | 61.0 |
| 2.185 | 0 | 643.1 | 823.8 | 0 | 969743 | 1889138 | 0.0 | 14.6 | 28.4 | 43.0 | 0.0 | 33.9 | 66.1 |
| SINK | 6.1 | 50 | 94.9 | 11281 | 71370 | 228557 | 0.2 | 1.1 | 3.4 | 4.7 | 3.6 | 22.9 | 73.4 |
| | | | | | | | ----- | ----- | ----- | | | | |
| WEIGHT FRACTION OF 6x10 IN S.G. FRACTION (%) | | | | 2233043 | 1857697 | 2557650 | 33.6 | 27.9 | 38.5 | 100.0 | | | |
| | | | | ------ | ------- | ------- | | | | | | | |
| | | | | | | 6648390 | | | | | | | |

| | | | |
|---|---|---|---|
| 1.995 | 53.2 | 61.9 | 42.9 |
| 2.015 | 54.2 | 63.1 | 44.4 |
| 2.035 | 60.7 | 68.6 | 63.6 |
| 2.055 | 62.7 | 68.7 | 72.1 |
| 2.075 | 57.1 | 68.8 | 70.3 |
| 2.015 | 60.7 | 68.3 | 71.2 |
| 2.125 | 55.6 | 66.9 | 69.3 |
| 2.155 | 0 | 54.6 | 68.9 |
| 2.185 | 0 | 61.8 | 63.7 |
| SINK | 46.7 | 58.5 | 66.9 |

TEST # 11

| | | (%) |
|---|---|---|
| PRODUCT WT. FRACTION | F | 39.6 |
| | S2 | 24.4 |
| -10 MESH MATERIAL | S1 | 36 |

| S.G. mean (g/ml) | WEIGHT OF S.G. FRACTION (g) F | S2 | S1 | UNITS F | S2 | S1 | COMPLETE DISTRIBUTION OF -10 MESH MATERIAL (%) F | S2 | S1 | TOT | S.G. FRACTION DISTRIBUTION (%) F | S2 | S1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.995 | 891.9 | 200.9 | 3.4 | 1525791 | 161274 | 5949 | 41.8 | 4.4 | 0.2 | 46.4 | 90.1 | 9.5 | 0.4 |
| 2.015 | 111.9 | 30.6 | 1.8 | 167944 | 18293 | 3240 | 4.6 | 0.5 | 0.1 | 5.2 | 88.6 | 9.7 | 1.7 |
| 2.035 | 21.6 | 38.1 | 2.3 | 23950 | 15618 | 1880 | 0.7 | 0.4 | 0.1 | 1.1 | 57.8 | 37.7 | 4.5 |
| 2.055 | 12.9 | 36.3 | 4.3 | 17420 | 14880 | 2167 | 0.5 | 0.4 | 0.1 | 0.9 | 50.5 | 43.2 | 6.3 |
| 2.075 | 4.3 | 34.8 | 12 | 4870 | 14095 | 3283 | 0.1 | 0.4 | 0.1 | 0.6 | 21.9 | 63.4 | 14.8 |
| 2.015 | 2.8 | 39.5 | 22.9 | 3958 | 17927 | 9398 | 0.1 | 0.5 | 0.3 | 0.9 | 12.7 | 57.3 | 30.0 |
| 2.125 | 1 | 32.9 | 28.3 | 1758 | 15654 | 14773 | 0.0 | 0.4 | 0.4 | 0.9 | 5.5 | 48.6 | 45.9 |
| 2.155 | 0 | 122.7 | 103.1 | 0 | 110175 | 67922 | 0.0 | 3.0 | 1.9 | 4.9 | 0.0 | 61.9 | 38.1 |
| 2.185 | 0 | 643.1 | 823.8 | 0 | 491148 | 797768 | 0.0 | 13.4 | 21.8 | 35.3 | 0.0 | 38.1 | 61.9 |
| SINK | 6.1 | 50 | 94.9 | 12875 | 42700 | 85068 | 0.4 | 1.2 | 2.3 | 3.9 | 9.2 | 30.4 | 60.5 |
| | | | | | | | | | | | | | |
| WEIGHT FRACTION OF -10 MESH IN S.G. FRACTION (%) | | | | 1758567 | 901764 | 991448 | 48.2 | 24.7 | 27.1 | 100.0 | | | |
| | | | | | | 3651779 | | | | | | | |
| 1.995 | 43.2 | 32.9 | 48.6 | | | | | | | | | | |
| 2.015 | 37.9 | 24.5 | 50.0 | | | | | | | | | | |
| 2.035 | 28.0 | 16.8 | 22.7 | | | | | | | | | | |
| 2.055 | 34.1 | 16.8 | 14.0 | | | | | | | | | | |
| 2.075 | 28.6 | 16.6 | 7.6 | | | | | | | | | | |
| 2.015 | 35.7 | 18.6 | 11.4 | | | | | | | | | | |
| 2.125 | 44.4 | 19.5 | 14.5 | | | | | | | | | | |
| 2.155 | 0.0 | 36.8 | 18.3 | | | | | | | | | | |
| 2.185 | 0.0 | 31.3 | 26.9 | | | | | | | | | | |
| SINK | 53.3 | 35.0 | 24.9 | | | | | | | | | | |

TEST # 11

| PRODUCT WT. FRACTION | | (%) |
|---|---|---|
| | F | 39.6 |
| | S2 | 24.4 |
| +6 MESH MATERIAL | S1 | 36 |

| S.G. mean (g/ml) | WEIGHT OF S.G. FRACTION (g) F | S2 | S1 | UNITS F | S2 | S1 | COMPLETE DISTRIBUTION OF +6 MESH MATERIAL (%) F | S2 | S1 | TOT | S.G. FRACTION DISTRIBUTION (%) F | S2 | S1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.995 | 891.9 | 200.9 | 3.4 | 127149 | 25980 | 1053 | 15.6 | 3.2 | 0.1 | 18.9 | 82.5 | 16.9 | 0.7 |
| 2.015 | 111.9 | 30.6 | 1.8 | 35007 | 9258 | 363 | 4.3 | 1.1 | 0.0 | 5.5 | 78.4 | 20.7 | 0.8 |
| 2.035 | 21.6 | 38.1 | 2.3 | 9580 | 13666 | 1126 | 1.2 | 1.7 | 0.1 | 3.0 | 39.3 | 56.1 | 4.6 |
| 2.055 | 12.9 | 36.3 | 4.3 | 1635 | 12932 | 2167 | 0.2 | 1.6 | 0.3 | 2.0 | 9.8 | 77.3 | 13.0 |
| 2.075 | 4.3 | 34.8 | 12 | 2435 | 12397 | 9504 | 0.3 | 1.5 | 1.2 | 3.0 | 10.0 | 50.9 | 39.1 |
| 2.015 | 2.8 | 39.5 | 22.9 | 399 | 12626 | 14509 | 0.0 | 1.5 | 1.8 | 3.4 | 1.4 | 45.9 | 52.7 |
| 2.125 | 1 | 32.9 | 28.3 | 0 | 10998 | 16606 | 0.0 | 1.3 | 2.0 | 3.4 | 0.0 | 39.8 | 60.2 |
| 2.155 | 0 | 122.7 | 103.1 | 0 | 25747 | 47137 | 0.0 | 3.2 | 5.8 | 8.9 | 0.0 | 35.3 | 64.7 |
| 2.185 | 0 | 643.1 | 823.8 | 0 | 109841 | 278774 | 0.0 | 13.5 | 34.1 | 47.6 | 0.0 | 28.3 | 71.7 |
| SINK | 6.1 | 50 | 94.9 | 0 | 7930 | 27673 | 0.0 | 1.0 | 3.4 | 4.4 | 0.0 | 22.3 | 77.7 |
| | | | | | | | ----- | ----- | ----- | | | | |
| WEIGHT FRACTION OF +6 IN S.G. FRACTION (%) | | | | 176205 | 241376 | 398913 | 21.6 | 29.6 | 48.9 | 100.0 | | | |
| | | | | ------ | ------- | ------- | | | | | | | |
| | | | | | | 816493 | | | | | | | |
| 1.995 | 3.6 | 5.3 | 8.6 | | | | | | | | | | |
| 2.015 | 7.9 | 12.4 | 5.6 | | | | | | | | | | |
| 2.035 | 11.2 | 14.7 | 13.6 | | | | | | | | | | |
| 2.055 | 3.2 | 14.6 | 14 | | | | | | | | | | |
| 2.075 | 14.3 | 14.6 | 22 | | | | | | | | | | |
| 2.015 | 3.6 | 13.1 | 17.6 | | | | | | | | | | |
| 2.125 | 0 | 13.7 | 16.3 | | | | | | | | | | |
| 2.155 | 0 | 8.6 | 12.7 | | | | | | | | | | |
| 2.185 | 0 | 7 | 9.4 | | | | | | | | | | |
| SINK | 0 | 6.5 | 8.1 | | | | | | | | | | |

TEST # 14

| | | (%) |
|---|---|---|
| PRODUCT WT. FRACTION | F | 25.6 |
| | S2 | 42.9 |
| whole sample | S1 | 31.5 |

| S.G. mean | WEIGHT FLOAT F | MIDDLINGS S2 | TAILS S1 | UNITS F | S2 | S1 | DISTRIBUTION F | S2 | S1 |
|---|---|---|---|---|---|---|---|---|---|
| 1.995 | 711.8 | 77.0 | 0.9 | 1822208.0 | 330330.0 | 2835.0 | 84.5 | 15.3 | 0.1 |
| 2.015 | 224.0 | 82.8 | 5.3 | 573440.0 | 355212.0 | 16695.0 | 60.7 | 37.6 | 1.8 |
| 2.035 | 55.4 | 59.9 | 9.2 | 141824.0 | 256971.0 | 28980.0 | 33.2 | 60.1 | 6.8 |
| 2.055 | 16.5 | 48.7 | 11.9 | 42240.0 | 208923.0 | 37485.0 | 14.6 | 72.4 | 13.0 |
| 2.075 | 15.4 | 54.4 | 26.5 | 39424.0 | 233376.0 | 83475.0 | 11.1 | 65.5 | 23.4 |
| 2.015 | 13.1 | 67.7 | 57.0 | 33536.0 | 290433.0 | 179550.0 | 6.7 | 57.7 | 35.7 |
| 2.125 | 0.0 | 48.6 | 51.9 | 0.0 | 208494.0 | 163485.0 | 0.0 | 56.0 | 44.0 |
| 2.155 | 0.0 | 97.9 | 157.1 | 0.0 | 419991.0 | 494865.0 | 0.0 | 45.9 | 54.1 |
| 2.185 | 0.0 | 368.2 | 625.7 | 0.0 | 1579578.0 | 1970955.0 | 0.0 | 44.5 | 55.5 |
| SINK | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | | | |
| wt.% of | 100.0 | 100.0 | 100.0 | | | | | | |

TEST # 14

| | | (%) |
|---|---|---|
| PRODUCT WT. FRACTION | F | 25.6 |
| | S2 | 42.9 |
| +6 MESH MATERIAL | S1 | 31.5 |

| S.G. mean (g/ml) | WEIGHT OF S.G. FRACTION (g) F | S2 | S1 | UNITS F | S2 | S1 | COMPLETE DISTRIBUTION OF +6 MESH MATERIAL (%) F | S2 | S1 | TOT | S.G. FRACTION DISTRIBUTION (%) F | S2 | S1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.995 | 711.8 | 77.0 | 0.9 | 397241 | 67057 | 315 | 9.5 | 1.6 | 0.0 | 11.1 | 85.5 | 14.4 | 0.1 |
| 2.015 | 224.0 | 82.8 | 5.3 | 137626 | 85961 | 4641 | 3.3 | 2.1 | 0.1 | 5.5 | 60.3 | 37.7 | 2.0 |
| 2.035 | 55.4 | 59.9 | 9.2 | 80414 | 139021 | 9766 | 1.9 | 3.3 | 0.2 | 5.5 | 35.1 | 60.7 | 4.3 |
| 2.055 | 16.5 | 48.7 | 11.9 | 27287 | 154394 | 22304 | 0.7 | 3.7 | 0.5 | 4.9 | 13.4 | 75.7 | 10.9 |
| 2.075 | 15.4 | 54.4 | 26.5 | 28149 | 163363 | 54843 | 0.7 | 3.9 | 1.3 | 5.9 | 11.4 | 66.3 | 22.3 |
| 2.015 | 0.0 | 67.7 | 57.0 | 0 | 212016 | 123171 | 0.0 | 5.1 | 3.0 | 8.0 | 0.0 | 63.3 | 36.7 |
| 2.125 | 0.0 | 48.6 | 51.9 | 0 | 154911 | 120979 | 0.0 | 3.7 | 2.9 | 6.6 | 0.0 | 56.1 | 43.9 |
| 2.155 | 0.0 | 97.9 | 157.1 | 0 | 233515 | 293950 | 0.0 | 5.6 | 7.0 | 12.6 | 0.0 | 44.3 | 55.7 |
| 2.185 | 0.0 | 368.2 | 625.7 | 0 | 540216 | 593257 | 0.0 | 13.0 | 14.2 | 27.2 | 0.0 | 47.7 | 52.3 |
| SINK | 13.1 | 115.8 | 247.2 | 16500 | 244417 | 264751 | 0.4 | 5.9 | 6.3 | 12.6 | 3.1 | 46.5 | 50.4 |
| | | | | | | | 16.5 | 47.8 | 35.7 | 100.0 | | | |
| WEIGHT FRACTION OF +6 MESH IN S.G. FRACTION (%) | | | | 687217 | 1994871 | 1487977 | | | | | | | |
| | | | | | | 4170066 | | | | | | | |
| 1.995 | 21.8 | 20.3 | 11.1 | | | | | | | | | | |
| 2.015 | 24.0 | 24.2 | 27.8 | | | | | | | | | | |
| 2.035 | 56.7 | 54.1 | 33.7 | | | | | | | | | | |
| 2.055 | 64.6 | 73.9 | 59.5 | | | | | | | | | | |
| 2.075 | 71.4 | 70.0 | 65.7 | | | | | | | | | | |
| 2.015 | 0.0 | 73.0 | 68.6 | | | | | | | | | | |
| 2.125 | 0.0 | 74.3 | 74.0 | | | | | | | | | | |
| 2.155 | 0.0 | 55.6 | 59.4 | | | | | | | | | | |
| 2.185 | 0.0 | 34.2 | 30.1 | | | | | | | | | | |
| SINK | 49.2 | 49.2 | 34.0 | | | | | | | | | | |

TEST # 14

| | | (%) |
|---|---|---|
| PRODUCT WT. FRACTION | F | 25.6 |
| | S2 | 42.9 |
| 6x10 MESH MATERIAL | S1 | 31.5 |

| S.G. mean (g/ml) | WEIGHT OF S.G. FRACTION (g) F | S2 | S1 | UNITS F | S2 | S1 | COMPLETE DISTRIBUTION OF 6x10 MESH MATERIAL (%) F | S2 | S1 | TOT | S.G. FRACTION DISTRIBUTION (%) F | S2 | S1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.995 | 711.8 | 77.0 | 0.9 | 688795 | 125525 | 1259 | 20.3 | 3.7 | 0.0 | 24.0 | 84.5 | 15.4 | 0.2 |
| 2.015 | 224.0 | 82.8 | 5.3 | 169165 | 123969 | 4975 | 5.0 | 3.6 | 0.1 | 8.8 | 56.7 | 41.6 | 1.7 |
| 2.035 | 55.4 | 59.9 | 9.2 | 28932 | 68097 | 9766 | 0.9 | 2.0 | 0.3 | 3.1 | 27.1 | 63.8 | 9.1 |
| 2.055 | 16.5 | 48.7 | 11.9 | 6716 | 35099 | 9596 | 0.2 | 1.0 | 0.3 | 1.5 | 13.1 | 68.3 | 18.7 |
| 2.075 | 15.4 | 54.4 | 26.5 | 4573 | 43875 | 19533 | 0.1 | 1.3 | 0.6 | 2.0 | 6.7 | 64.5 | 28.7 |
| 2.015 | 0.0 | 67.7 | 57.0 | 0 | 44146 | 41656 | 0.0 | 1.3 | 1.2 | 2.5 | 0.0 | 51.5 | 48.5 |
| 2.125 | 0.0 | 48.6 | 51.9 | 0 | 31483 | 31389 | 0.0 | 0.9 | 0.9 | 1.9 | 0.0 | 50.1 | 49.9 |
| 2.155 | 0.0 | 97.9 | 157.1 | 0 | 90718 | 124211 | 0.0 | 2.7 | 3.7 | 6.3 | 0.0 | 42.2 | 57.8 |
| 2.185 | 0.0 | 368.2 | 625.7 | 0 | 491249 | 935685 | 0.0 | 14.5 | 24.6 | 39.1 | 0.0 | 37.0 | 63.0 |
| SINK | 13.1 | 115.8 | 247.2 | 6439 | 116247 | 244506 | 0.2 | 3.4 | 7.2 | 10.8 | 1.8 | 31.7 | 66.6 |
| | | | | | | | ----- | ----- | ----- | | | | |
| WEIGHT FRACTION OF 6x10 MESH | | | | 904620 | 1170408 | 1322576 | 26.625 | 34.448 | 38.926 | 100 | | | |
| IN S.G. FRACTION (%) | | | | ------ | ------- | ------- | | | | | | | |
| | | | | | | 3397603 | | | | | | | |
| 1.995 | 37.8 | 38.0 | 44.4 | | | | | | | | | | |
| 2.015 | 29.5 | 34.9 | 29.8 | | | | | | | | | | |
| 2.035 | 20.4 | 26.5 | 33.7 | | | | | | | | | | |
| 2.055 | 15.9 | 16.8 | 25.6 | | | | | | | | | | |
| 2.075 | 11.6 | 18.8 | 23.4 | | | | | | | | | | |
| 2.015 | 0.0 | 15.2 | 23.2 | | | | | | | | | | |
| 2.125 | 0.0 | 15.1 | 19.2 | | | | | | | | | | |
| 2.155 | 0.0 | 21.6 | 25.1 | | | | | | | | | | |
| 2.185 | 0.0 | 31.1 | 42.4 | | | | | | | | | | |
| SINK | 19.2 | 23.4 | 31.4 | | | | | | | | | | |

TEST # 14

| PRODUCT WT. FRACTION | | (%) |
|---|---|---|
| | F | 25.6 |
| | S2 | 42.9 |
| -10 MESH MATERIAL | S1 | 31.5 |

| S.G. mean (g/ml) | WEIGHT OF S.G. FRACTION (g) F | S2 | S1 | UNITS F | S2 | S1 | COMPLETE DISTRIBUTION OF -10 MESH MATERIAL (%) F | S2 | S1 | TOT | S.G. FRACTION DISTRIBUTION (%) F | S2 | S1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.995 | 711.8 | 77.0 | 0.9 | 736172 | 137748 | 1259 | 22.8 | 4.3 | 0.0 | 27.1 | 84.1 | 15.7 | 0.1 |
| 2.015 | 224.0 | 82.8 | 5.3 | 266650 | 144926 | 7947 | 8.3 | 4.5 | 0.2 | 13.0 | 63.6 | 34.5 | 1.9 |
| 2.035 | 55.4 | 59.9 | 9.2 | 32478 | 49852 | 9447 | 1.0 | 1.5 | 0.3 | 2.8 | 35.4 | 54.3 | 10.3 |
| 2.055 | 16.5 | 48.7 | 11.9 | 8237 | 19221 | 5585 | 0.3 | 0.6 | 0.2 | 1.0 | 24.9 | 58.2 | 16.9 |
| 2.075 | 15.4 | 54.4 | 26.5 | 6663 | 27072 | 9099 | 0.2 | 0.8 | 0.3 | 1.3 | 15.6 | 63.2 | 21.2 |
| 2.015 | 0.0 | 67.7 | 57.0 | 0 | 34271 | 14723 | 0.0 | 1.1 | 0.5 | 1.5 | 0.0 | 69.9 | 30.1 |
| 2.125 | 0.0 | 48.6 | 51.9 | 0 | 22100 | 10953 | 0.0 | 0.7 | 0.3 | 1.0 | 0.0 | 66.9 | 33.1 |
| 2.155 | 0.0 | 97.9 | 157.1 | 0 | 95758 | 76704 | 0.0 | 3.0 | 2.4 | 5.3 | 0.0 | 55.5 | 44.5 |
| 2.185 | 0.0 | 368.2 | 625.7 | 0 | 548114 | 543984 | 0.0 | 17.0 | 16.9 | 33.9 | 0.0 | 50.2 | 49.8 |
| SINK | 13.1 | 115.8 | 247.2 | 10631 | 136118 | 270202 | 0.3 | 4.2 | 8.4 | 12.9 | 2.5 | 32.6 | 64.8 |
| | | | | | | | 22.9 | 37.7 | 29.4 | 100.0 | | | |
| WEIGHT FRACTION OF -10 MESH IN S.G. FRACTION (%) | | | | 1060830 | 1215180 | 949902 | | | | | | | |
| | | | | | | 3225913 | | | | | | | |
| 1.995 | 40.4 | 41.7 | 44.4 | | | | | | | | | | |
| 2.015 | 46.5 | 40.8 | 47.6 | | | | | | | | | | |
| 2.035 | 22.9 | 19.4 | 32.6 | | | | | | | | | | |
| 2.055 | 19.5 | 9.2 | 14.9 | | | | | | | | | | |
| 2.075 | 16.9 | 11.6 | 10.9 | | | | | | | | | | |
| 2.015 | 0.0 | 11.8 | 8.2 | | | | | | | | | | |
| 2.125 | 0.0 | 10.6 | 6.7 | | | | | | | | | | |
| 2.155 | 0.0 | 22.8 | 15.5 | | | | | | | | | | |
| 2.185 | 0.0 | 34.7 | 27.6 | | | | | | | | | | |
| SINK | 31.7 | 27.4 | 34.7 | | | | | | | | | | |

## TABLE 3

## RECOVERY OF +6 MESH MATERIAL TO CONCENTRATE

+ 6 MESH MATERIAL

| | % +6 Recovered To Float | % +6 in Feed | % of +6 Mesh Feed Recovered | % of $K_2O$ Values Recovered | Recovery Ratio Test # 14/11 | |
|---|---|---|---|---|---|---|
| At 1.995 S.G. | | | | | | |
| TEST #11 | 15.6 | 9.5 | 1.5 | 3.2 | 2.6 | (Times as much on grade +6 mesh material) |
| TEST #14 | 9.5 | 41.3 | 3.9 | 9.75 | | |
| At 2.015 S.G. | | | | | | |
| TEST #11 | 19.9 | 9.5 | 1.9 | 4.1 | 2.8 | |
| TEST #14 | 12.8 | 41.3 | 5.3 | 13.25 | | |
| At 2.035 S.G. | | | | | | |
| TEST #11 | 21.1 | 9.5 | 2.0 | 4.2 | 3.0 | |
| TEST #14 | 14.7 | 41.3 | 6.1 | 15.0 | | |

# APPENDIX C

PROGRESS REPORT #3

## A. HIGHLIGHT REPORT

## HEAVY MEDIA SEPARATION OF POTASH ORE

### 1.0 GENERAL

This report covers the third period of this project, which includes testing during the months of April, May and June, 1987. Test work carried out during this phase included photographic analysis of particle locking characteristics in Tri-Flo separator products, size degradation analysis of middling product crushing, and heavy media separation lab tests on concentrator samples. A visit was also made to view a pilot plant scale Tri-Flo separator in operation at the Noranda Geco operation in Western Ontario. The next phase of this Tri-Flo separation of potash ores would include the use of this pilot plant at several Saskatchewan potash mines.

### 2.0 SCHEDULE

The photographic, degradation and analytical laboratory testing of the Tri-Flo separator products is now complete. The work phase of this project is now finished. The remaining work involves compilation and preparation of the final report. No obstacles or hindrances have been encountered throughout this project. Preparation of the final report is expected to commence in September after the holiday season.

#### 2.1 Overall

Control Schedule Completion - March 31, 1988
Probable Completion - March 31, 1988

#### 2.2 Milestone

Completion of Testing Program - June 30, 1987

### 3.0 COST SUMMARY

Expenditures for this period totalled $18,993.73. This brings the total expenditures for this project to $71,110.12. The total expenditure has now exceeded the allowable sum as stated in the contract with Supply and Services Canada.

The completion of the analytical laboratory work required 310 man-hours to complete, versus a plan of only 207 man-hours. In addition, the unplanned trip to the "Noranda Geco" operation in Western Ontario was also made. This trip involved two people over three days and their travel expenses.

Total labor charges for this period were $17,000. The remaining $1,993.73 represents travel and living charges as well as photographic processing charges. A "contract plan and report form" is included and represents the progress on the project.

| | | |
|---|---|---|
| 3.1 | Control Net Estimate | $ 65,113.00 |
| 3.2 | Expenditures this Period | $ 18,993.73 |
| 3.3 | Total Expenditure | $ 71,110.12 |
| 3.4 | Crown Portion Maximum | $ 32,556.50 |

## 4.0 HIGHLIGHTS

The progress on this project has been carried out within the time constraints. The costs have overrun the expected final sum due to labor charges related to laboratory work.

The positive results obtained for the previous work and the recent laboratory work have confirmed that some processing gains may be obtained with the replacement of portions of the existing flotation process with a Tri-Flo separation process. Future study using a Tri-Flo pilot plant at the mine site will be required. This will assist in obtaining more information on continuous operation and costs which are needed to forecast the economical viability of a full scale installation.

CLittmann/red
Vanscoy Office
July 29, 1987

## B. PROJECT PROGRESS

## HEAVY MEDIA SEPARATION OF POTASH ORE

### 1.0 INTRODUCTION

The following is the third Progress Report for the Heavy Media Separation Project. It covers testwork conducted in the period March - June, 1987.

Testwork is broken into 3 sections:

1) Photographic analysis of particle locking characteristics in Tri-Flo products.

2) Theoretical size degradations of crushed middling products.

3) HMS lab testwork on plant samples.

### 2.0 SUMMARY AND CONCLUSIONS

2.1 The KCl/NaCl/WI associations in middling product particles are, for the most part, simple. Associations are predominantly KCl-NaCl combinations with some unscrubbed insol. The component associations are coarse grained with contact between components occurring on only a few grain boundaries.

2.2 As a result of 2.1, further middlings processing will entail breaking (crushing) of the middlings particles rather than grinding in order to liberate the KCl valves. This confirms current plant practice.

2.3 A significant portion of the crushed middlings product will be too small to be reprocessed in the Tri-Flo separator and will have to be upgraded by flotation. Only middlings particles at sizes greater than approximately 6 mesh will be of sufficient size to reprocess in the Tri-Flo separator after crushing.

2.4 Results of testwork on plant samples show no significant improvement in recovery performance until the material reaches the rougher flotation feed circuit. This indicates that "scrubbing" of the particles continues to occur past the scrubbers and through the insol flotation circuit, at least in our plant circuits.

2.5 Scrubbing serves two functions:

1. Upgrades the particles which would already report to a "float product" at a given separation density, and allows these particles to be recovered as product grade.

2. Cleans up particles which, without scrubbing, would report as part of a middlings product; hence, improving recovery.

## 3.0 RECOMMENDATIONS

Based on the results of testwork completed to date, the following work is recommended:

3.1 Pilot Scale (10-12 tonnes per hour) test work be conducted on a continuous basis in order to determine:

1) Effect of ore variations.
2) Ability to control media density sufficiently.
3) Optimum percentage of middling product.
4) Effect of insol (clays) on separation performance.
5) Any unique operating considerations for a Tri-Flo plant installation.

GAWhite/red
Vanscoy Office
July 27, 1987

## 4.0 DETAILS

### 4.1 Photographic Analysis

#### 4.1.1 Purpose

Samples from Tri-Flo products resulting from Lakefield tests #11 and #12 (see Progress Report 2) were photographed in order to observe and record the different locking characteristics exhibited by the particles reporting to the Tri-Flo products.

#### 4.1.2 Procedure

X-ray bombardment of sylvinite ore causes a temporary discoloration of the components as follows:

1) KCl - purple
2) NaCl - yellow
3) WI - no change

In cases where iron has stained the KCl crystals, the particles are brown rather than purple.

Each of the three products from each test had been previously separated into three size fractions.

1) +6 mesh
2) -6 +10 mesh
3) -10 mesh

Each size fraction had, in turn, been separated in the HMS analysis technique into the following ten specific gravity fractions: 1.995; 2.015; 2.035; 2.055; 2.075; 2.105; 2.125; 2.155; 2.185, sink.

A portion of each of the S.G. fractions from the $S_1$ and $S_2$ products was subjected to X-ray bombardment and photographed.

#### 4.1.3 Data

A selection of photographs from the above testwork is included in Appendix 1.

The photographs are broken into two sections.

1) Section 1

| S.G. | Test # | Product | Mesh | Photograph # |
|---|---|---|---|---|
| 2.055 | 14 | $S_1$ | +6 | 1 |
| 2.055 | 14 | $S_2$ | +6 | 2 |
| 2.055 | 11 | $S_1$ | +6 | 3 |
| 2.055 | 11 | $S_2$ | +6 | 4 |

2) Section 2

All photographs are from the $S_2$ (middlings) product.

| S.G. | Test # | +6 Mesh Photo # | -6x10 Mesh Photo # | -10 Mesh Photo # |
|---|---|---|---|---|
| 1.995 | 14 | 5 | 13 | 21 |
| 1.995 | 11 | 6 | 14 | 22 |
| 2.035 | 14 | 7 | 15 | 23 |
| 2.035 | 11 | 8 | 16 | 24 |
| 2.155 | 14 | 9 | 17 | 25 |
| 2.155 | 11 | 10 | 18 | 26 |
| 2.185 | 14 | 11 | 19 | 27 |
| 2.185 | 11 | 12 | 20 | 28 |

Particles shown in all photographs are 1.5 times life size.

4.1.4 Discussion

Section 1

Section 1 of the photographs shows the +6 mesh, 2.055 Specific Gravity fraction from both the $S_1$ and $S_2$ products from tests #11 and #14.

Note the larger particles in test #11 versus #14 due to the larger sized feed material used in the testwork.

The particles in this S.G. fraction and likewise with the other S.G. fractions, show similar component locking characteristics regardless of particle size or product (i.e. $S_1$ or $S_2$) to which they reported. The fact that particles of a Specific Gravity lower than that of the separating media, and vice versa, report to the wrong product reflects inefficiencies in separation and does not appear to be related to particle characteristics.

Section 2

Section 2 of the photographs characterizes the component locking observed in particles at the following S.G. fractions:

1) 1.995
2) 2.035
3) 2.155
4) 2.185

The 1.995 fraction represents a product grade (50% $K_2O$) material and the 2.185 fraction a discardable tail.

The 2.035 and 2.155 photographs represent the possible component association limits which a middlings product would have.

Component associations in middling type particles are predominantly KCl/NaCl with some unscrubbed insol present. Locking is, for the most part, simple. The associations are coarse grained with contact between the two components occurring on only a few grain boundaries.

## 4.2 Size Degradation Calculations

### 4.2.1 Purpose

Calculations were performed to give an idea of the degree of size degradation resulting from recrushing a middlings type product. Particles of different sizes and different KCl content were considered.

### 4.2.2 Procedure and Results

Particles for simplicity were assumed to consist of only two components (KCl/NaCl) joined at one grain boundary. In addition breakage was assumed to occur only at the grain boundary resulting in two cubic particles.

A table of the resulting KCl particle sizes is included in Appendix 2. Also included is a sample calculation of the procedure used to arrive at these values.

4.2.3 Discussion

The table in Appendix 2 shows the mesh size of the KCl particles resulting from breakage of varying sizes of middling type particles and different KCl contents.

The resultant mesh sizes are the theoretical maximum. Actual mesh sizes would be at least 1 mesh size smaller than this.

At a cut-off point of 14 mesh (below which separation efficiencies in the Tri-Flo separator begin to fall and at a point where flotation is effective) it appears that only middlings at sizes greater than approximately 6 mesh would be of sufficient size to reprocess in the Tri-Flo separator after recrushing.

4.3 HMS Analysis of Plant Data

4.3.1 Purpose

Plant samples from various points in the Cominco concentrator were gathered in order to trace when and where the potash values have been sufficiently liberated from the NaCl and insol components in order to provide the best recovery performance in a Tri-Flo separator.

4.3.2 Procedure

The following samples were obtained from the concentrator circuits:

1) Scrubber Feed
2) Scrubber Discharge
3) Primary Insol Flotation Feed
4) Rougher Flotation Feed
5) Rougher Flotation Concentrate
6) Rougher Flotation Tails

The samples were taken at timed intervals equivalent to the residence times in each portion of the circuit. This allowed tracing of the same material through the processing steps.

Each sample was separated into three S.G. fractions +2.03; -2.03 + 2.10; -2.10.

Each S.G. fraction was further split into three size fractions +6 mesh; -6 + 10 mesh; -10 mesh.

4.3.3 Data

Results are included in Appendix 3.

4.3.4 Discussion

From the tables in Appendix 3, the following points are evident:

1) In the first three samples, recovery of potash values increase as particle size decreases, indicating, as would be expected, better KCl liberation at finer sizes.

2) NaCl and Insol show the same trend with more of these components reporting to the tails fraction in the finer sizes.

3) Better liberation of the smaller sizes also results in lesser amounts of middling material than in the larger particle sizes.

4) The first large increase in the amount of +6 mesh material reporting to the Float fraction occurs in the rougher feed sample, indicating that it takes this length of time and/or treatment to adequately liberate the potash values.

5) The finer sized particles appear to clean up earlier than do the coarser particles.

6) Scrubbing improves both grade and recovery. Improvements in grade are a result of cleaning up material which would already float at a given S.G. Improvements in recovery result from liberating Potash Values from NaCl and WI in a middling material; freeing potash valves which would otherwise not report as part of the float product from the Tri-Flo separator.

# APPENDIX 1

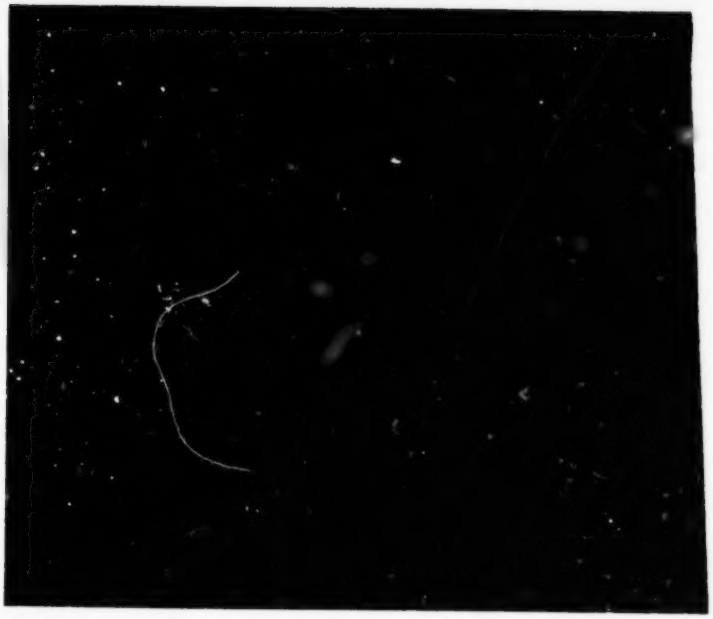
## SECTION 1

## SECTION 2

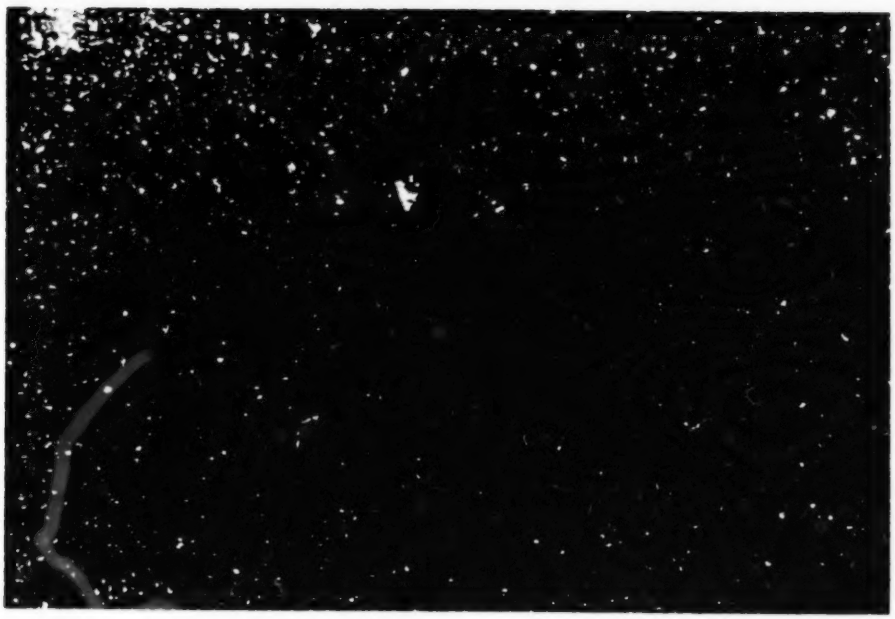
# SECTION 1

1. TEST # 14
   PRODUCT $S_1$
   S.G. 2.055
   MESH SIZE +6

2. TEST # 14
   PRODUCT $S_2$
   S.G. 2.055
   MESH SIZE +6



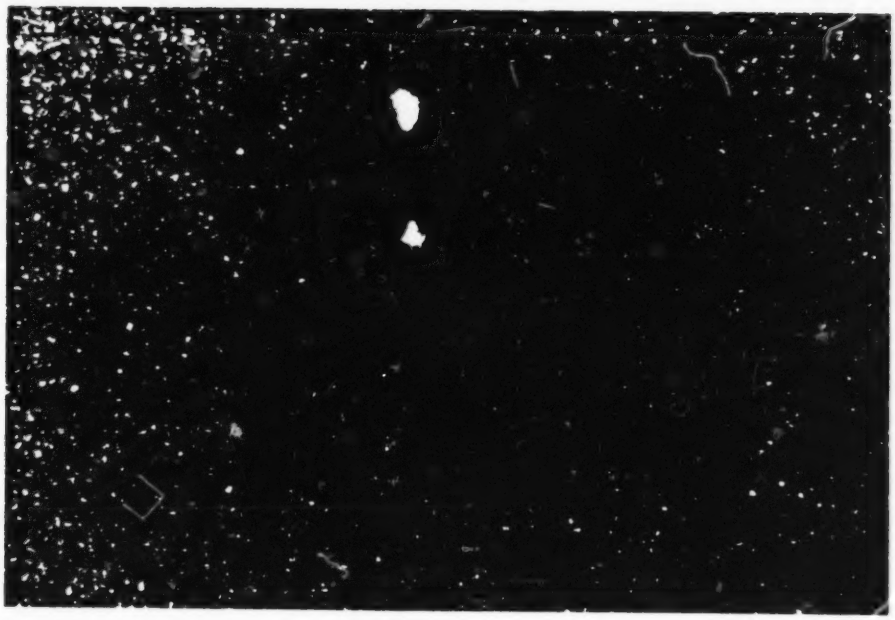
3. TEST # 11
PRODUCT $S_2$
S.G. 2.055
MESH SIZE +6



4. TEST # 11
PRODUCT $S_1$
S.G. 2.055
MESH SIZE +6

# SECTION 2

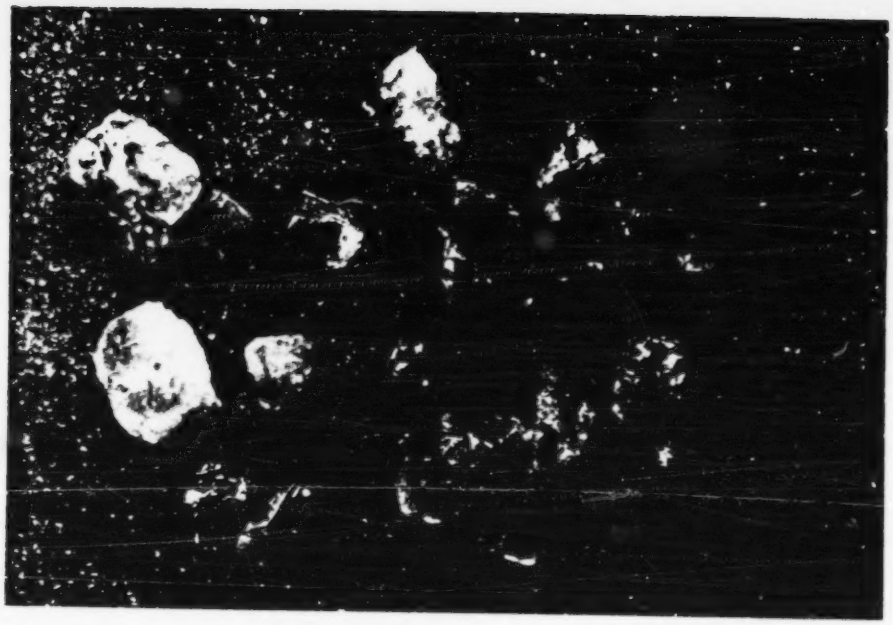
5. TEST # 14
   PRODUCT $S_2$
   S.G. 1.995
   MESH SIZE +6



6. TEST # 11
   PRODUCT $S_2$
   S.G. 1.995
   MESH SIZE +6

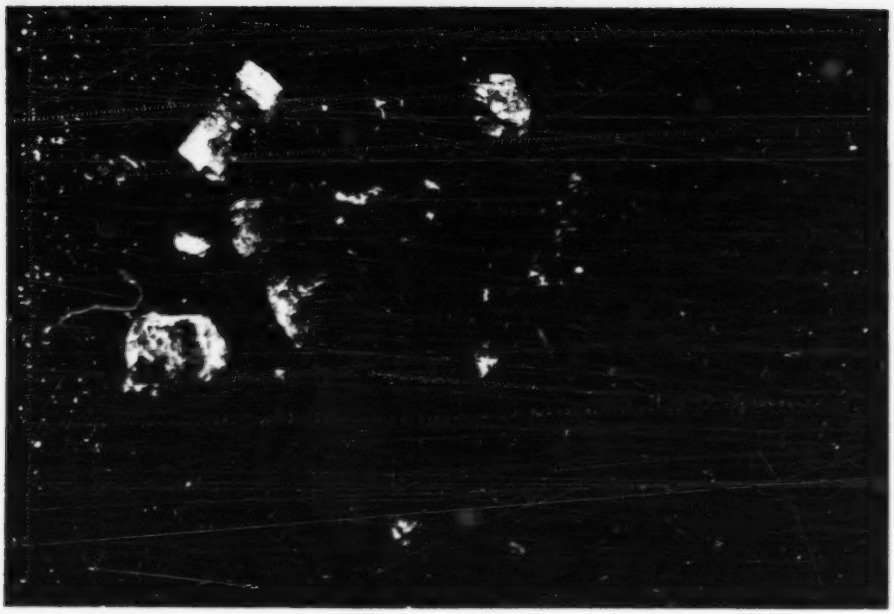
7. TEST # 14
PRODUCT $S_2$
S.G. 2.035
MESH SIZE +6

8. TEST # 11
PRODUCT $S_2$
S.G. 2.035
MESH SIZE +6

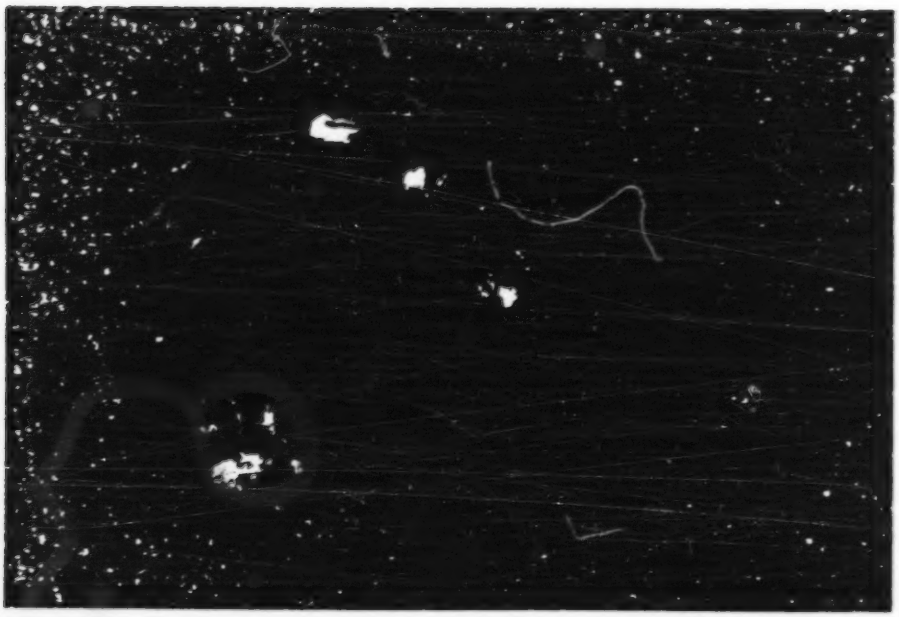


9. TEST # 14
PRODUCT $S_2$
S.G. 2.155
MESH SIZE +6

10. TEST # 11
PRODUCT $S_2$
S.G. 2.155
MESH SIZE +6



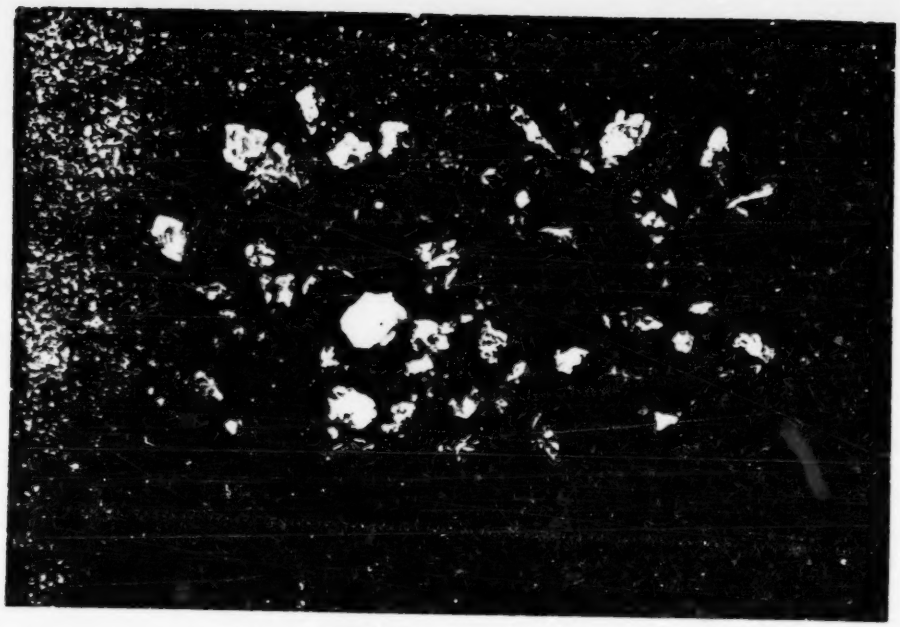
11. TEST # 14
PRODUCT $S_2$
S.G. 2.185
MESH SIZE +6



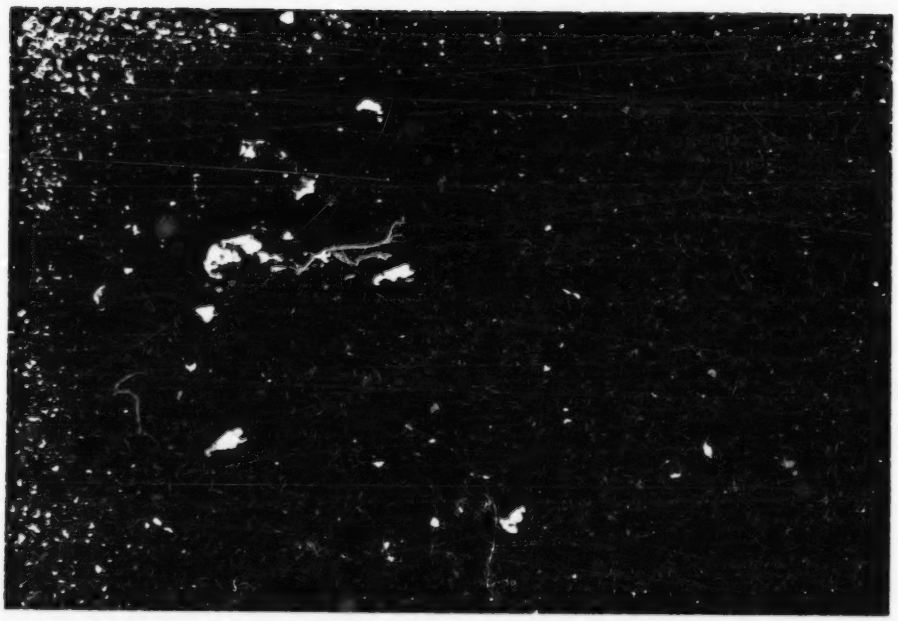
12. TEST # 11
PRODUCT $S_2$
S.G. 2.185
MESH SIZE +6

13. TEST # 14
PRODUCT $S_2$
S.G. 1.995
MESH SIZE -6 +10

14. TEST # 11
PRODUCT S,
S.G. 1.995
MESH SIZE -6 +10

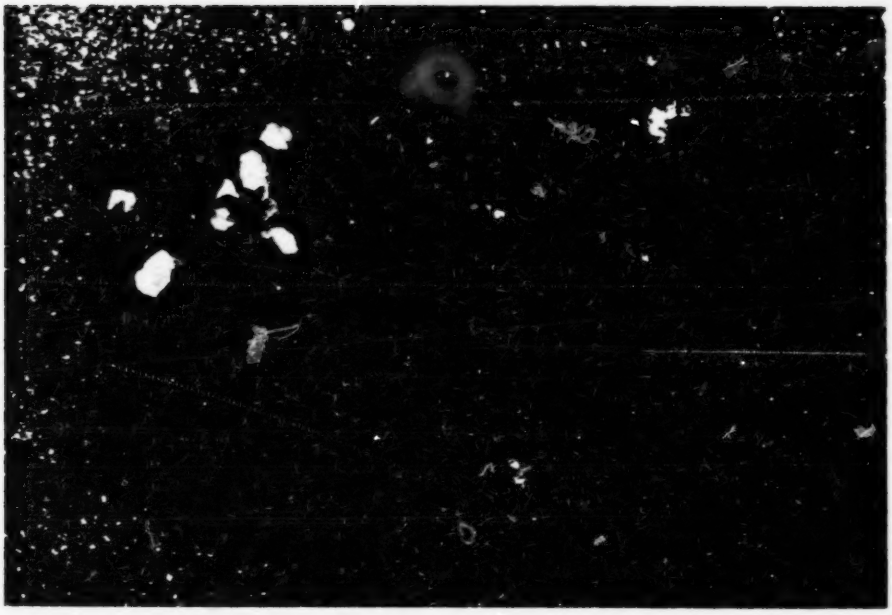


15. TEST # 14
PRODUCT $S_2$
S.G. 2.035
MESH SIZE -6 +10

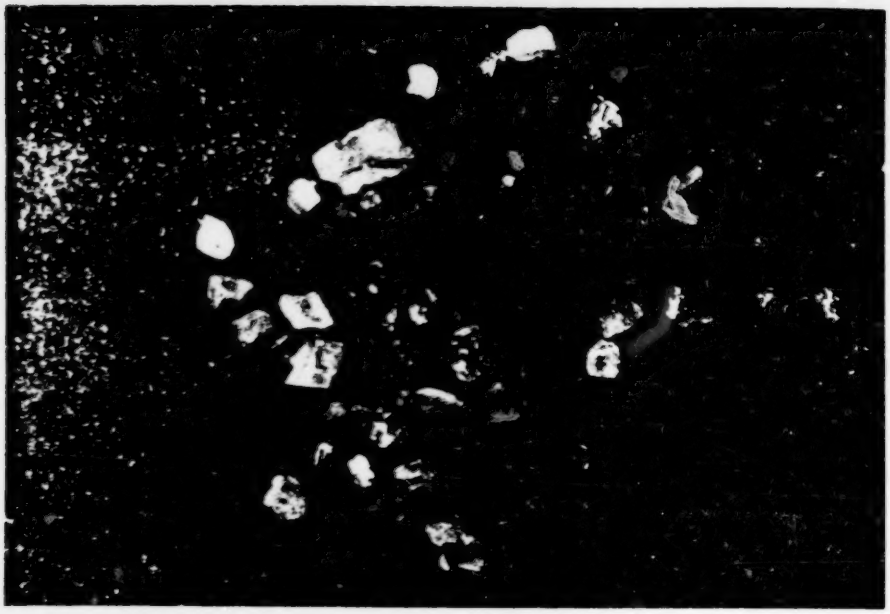


16. TEST # 11
PRODUCT $S_2$
S.G. 2.035
MESH SIZE -6 +10

17. TEST # 14
PRODUCT $S_2$
S.G. 2.155
MESH SIZE -6 +10

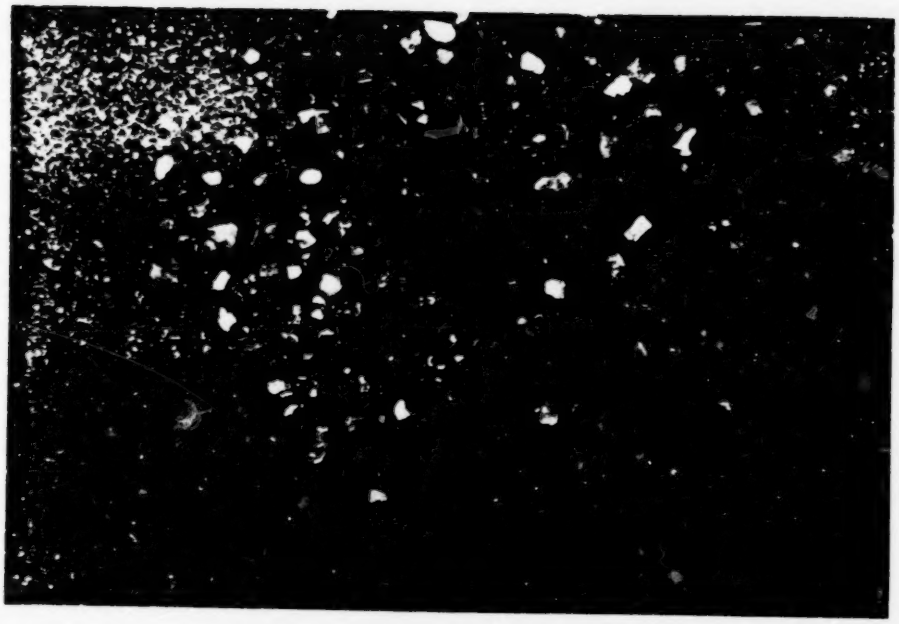


18. TEST # 11
PRODUCT $S_2$
S.G. 2.155
MESH SIZE -6 +10



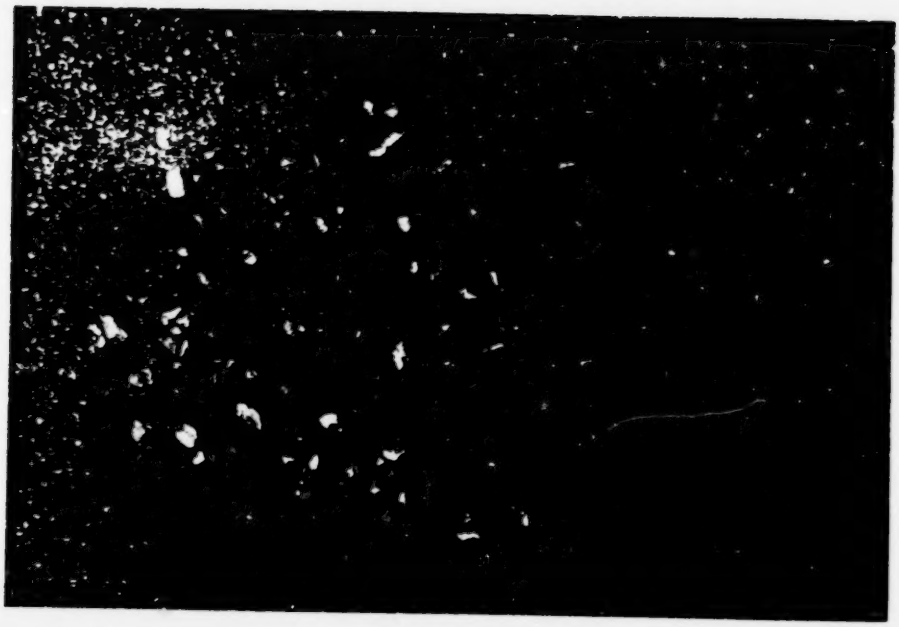
19. TEST # 14
PRODUCT $S_2$
S.G. 2.185
MESH SIZE -6 +10

20. TEST # 11
PRODUCT $S_2$
S.G. 2.185
MESH SIZE -5 +10

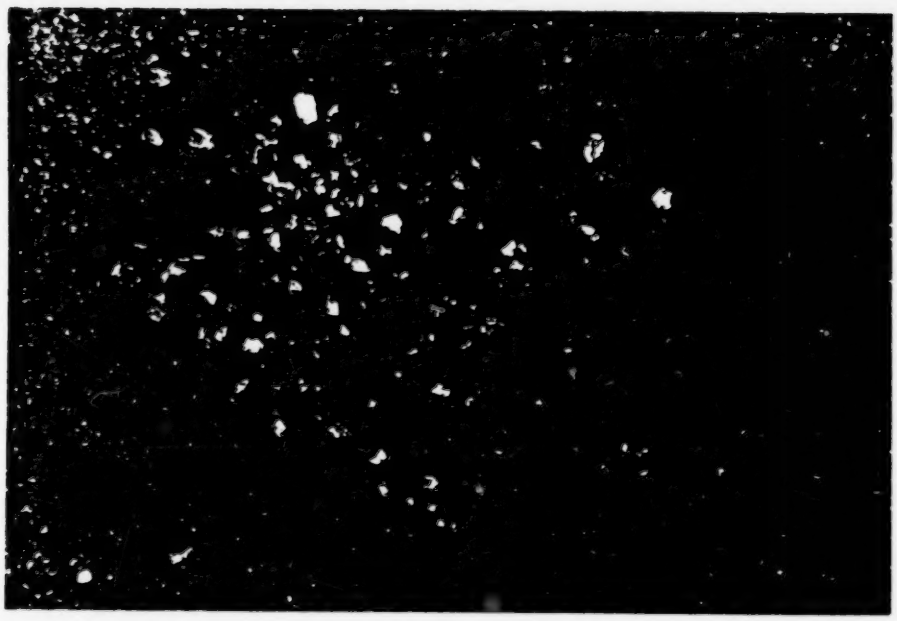


21. TEST # 14
PRODUCT $S_2$
S.G. 1.995
MESH SIZE -10

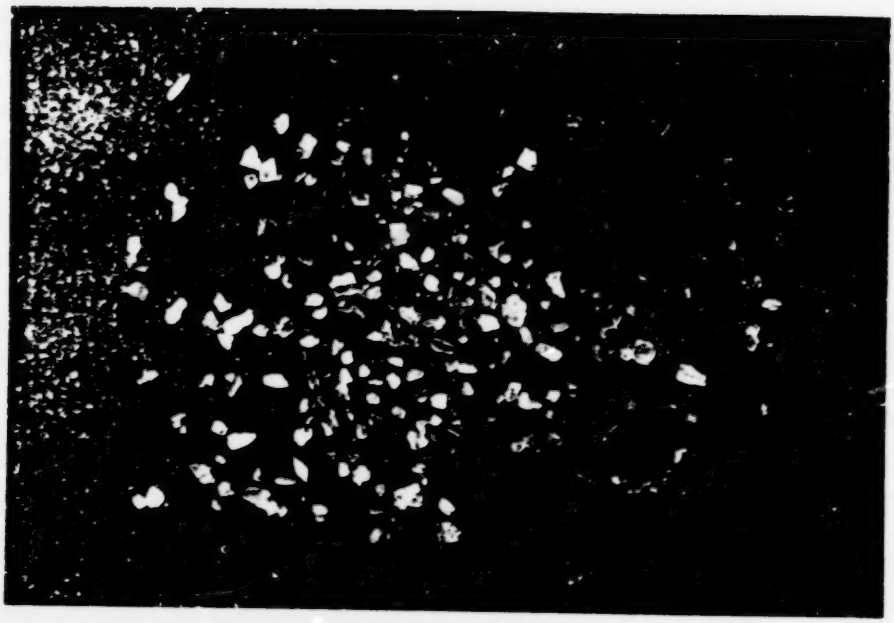
22. TEST # 11
PRODUCT $S_2$
S.G. 1.995
MESH SIZE -10



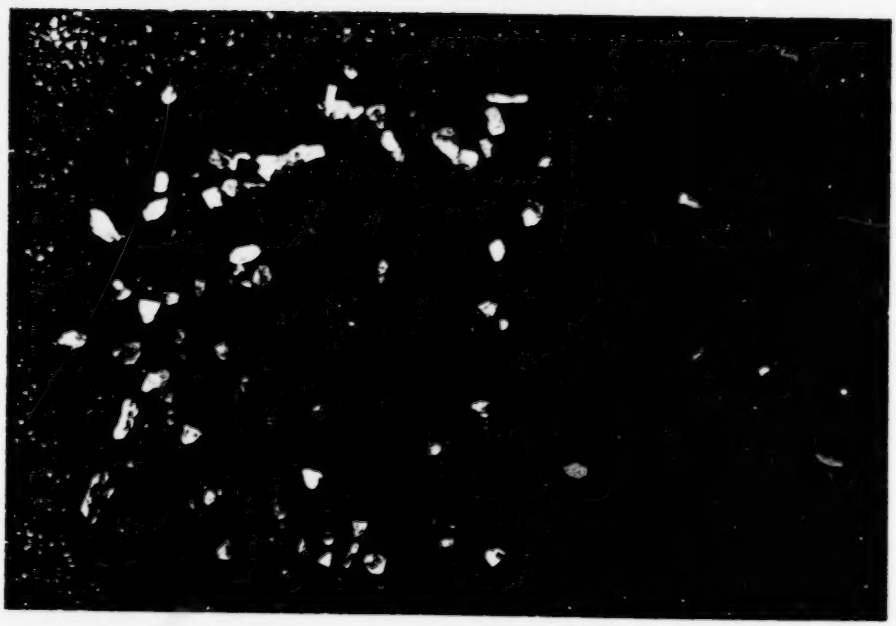
23. TEST # 11
PRODUCT $S_2$
S.G. 2.035
MESH SIZE -10



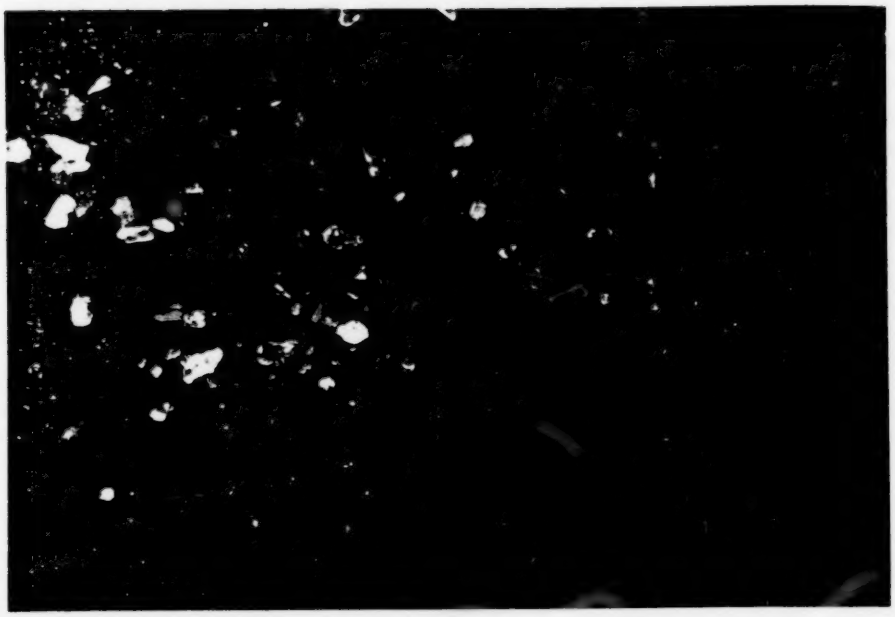
24. TEST # 14
PRODUCT $S_2$
S.G. 2.035
MESH SIZE -10



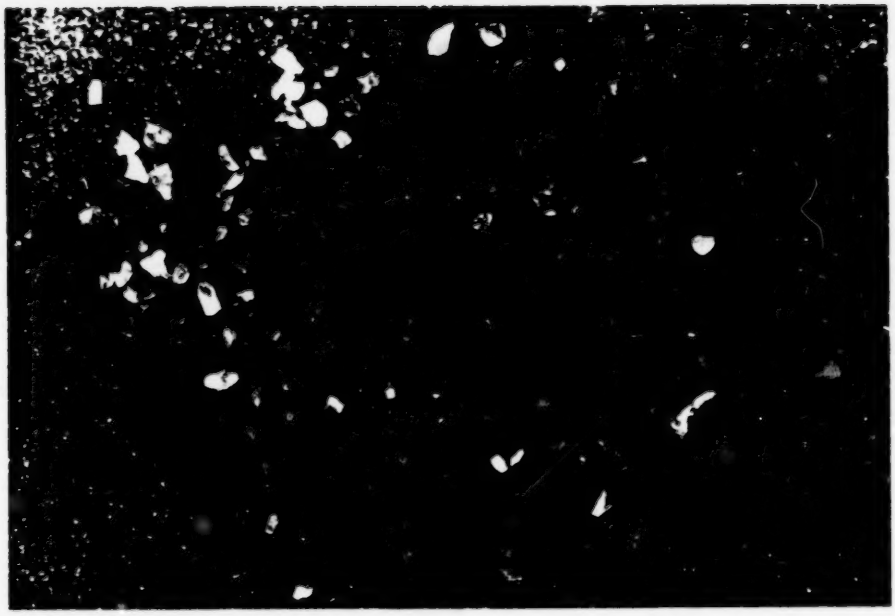
25. TEST # 14
PRODUCT $S_2$
S.G. 2.155
MESH SIZE -10



26. TEST # 11
PRODUCT $S_2$
S.G. 2.155
MESH SIZE -10



27. TEST # 14
PRODUCT $S_2$
S.G. 2.185
MESH SIZE -10



28. TEST # 11
PRODUCT $S_2$
S.G. 2.185
MESH SIZE -10

# APPENDIX 2

## THEORETICAL MAXIMUM MESH SIZE OF RESULTING KCL PARTICLE

| MM EQUIV. | MESH | VOL. | % K2O OF PART | 0.00 | 6.32 | 12.63 | 18.95 | 25.27 | 31.59 | 37.90 | 44.22 | 50.54 | 56.85 | 63.17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | % KCL OF PART. | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
| 6.70 | 3 | 300.8 | | * | 8 | 6 | 6 | 4 | 4 | 4 | 4 | 4 | 4 | 3 |
| 4.75 | 4 | 107.2 | | * | 10 | 8 | 8 | 6 | 6 | 6 | 6 | 6 | 6 | 4 |
| 3.35 | 6 | 37.6 | | * | 14 | 10 | 10 | 8 | 8 | 8 | 8 | 8 | 8 | 6 |
| 2.36 | 8 | 13.1 | | * | 20 | 14 | 14 | 10 | 10 | 10 | 10 | 10 | 10 | 8 |
| 1.70 | 10 | 4.9 | | * | * | 20 | 20 | 14 | 14 | 14 | 14 | 14 | 14 | 10 |
| 1.18 | 14 | 1.6 | | * | * | * | * | 20 | 20 | 20 | 20 | 20 | 20 | 14 |
| 0.85 | 20 | 0.6 | | * | * | * | * | * | * | * | * | * | * | 20 |

S.G.

NACL - 2.165
KCL - 1.984

SAMPLE CALC.

Starting particle - 3 Mesh
% KCl - 10

300.8/((0.1/1.984)+((1-0.1)/2.165)) = 645.3 gas total particle

.1 * 645.3 = 64.5 gas KCl

64.5/1.984 = 32.5 am3

Assuming a cubic particle

(32.5) = 3.19 am OR an 8 Mesh Part.

# APPENDIX 3

SCRUBBER FEED

+20 MESH FRACTION OF HEAD SAMPLE

| LAB NO. | MESH SIZE | WT. | WT.% | ACCUM WT.% | GRADE K20 | GRADE MI | GRADE HACL | DISTRIBUTION K20 | DISTRIBUTION MI | DISTRIBUTION HACL |
|---|---|---|---|---|---|---|---|---|---|---|
| | +6 | 129.7 | 5.9 | 5.9 | 19.0 | 2.9 | 66.9 | 4.5 | 5.3 | 6.9 |
| | -6 + 10 | 1011.4 | 45.9 | 51.8 | 23.7 | 3.0 | 59.6 | 43.4 | 42.3 | 47.8 |
| | -10 | 1063.2 | 48.2 | 100.0 | 27.0 | 3.6 | 53.7 | 52.1 | 52.4 | 45.3 |
| | TOTAL | 2204.3 | 100.0 | | 25.0 | 3.3 | 57.2 | 100.0 | 100.0 | 100.0 |

HMS RESULTS

| LAB NO. | MESH SIZE | WT. | WT.% | ACCUM WT.% | GRADE K20 | GRADE MI | GRADE HACL | OVERALL DISTRIBUTION K20 | OVERALL DISTRIBUTION MI | OVERALL DISTRIBUTION HACL | SCREEN FRACTION DISTRIBUTION +6 MESH F20 | +6 MESH MI | +6 MESH HACL | SCREEN FRACTION DISTRIBUTION -6 + 10 MESH K20 | -6 + 10 MESH MI | -6 + 10 MESH HACL | SCREEN FRACTION DISTRIBUTION -10 MESH K20 | -10 MESH MI | -10 MESH HACL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FLOAT 2.03 (F) | | | | | | | | | | | | | | | | | | | |
| 1295 | +6 | 15.1 | 1.7 | | 60.6 | 1.7 | 2.4 | 3.9 | 1.0 | 0.1 | 77.3 | 23.6 | 1.1 | | | | | | |
| 1296 | -6 + 10 | 159.3 | 17.5 | | 61.3 | 1.8 | 1.1 | 41.5 | 11.7 | 0.4 | | | | 86.3 | 24.1 | 0.7 | | | |
| 1297 | -10 | 164.1 | 18.1 | | 61.6 | 2.3 | 0.1 | 42.9 | 15.5 | 0.0 | | | | | | | 91.4 | 32.8 | 0.1 |
| | | 338.5 | | | | | | | | | | | | | | | | | |
| MIDDLINGS 2.10 (S2) | | | | | | | | | | | | | | | | | | | |
| 1298 | +6 | 4.8 | 0.5 | | 31.3 | 3.0 | 47.5 | 0.6 | 0.6 | 0.4 | 12.7 | 13.1 | 6.5 | | | | | | |
| 1299 | -6 + 10 | 24.2 | 2.7 | | 37.6 | 6.3 | 34.3 | 3.9 | 6.2 | 1.6 | | | | 8.0 | 12.0 | 3.2 | | | |
| 1300 | -10 | 15.8 | 1.7 | | 37.4 | 7.0 | 33.8 | 2.5 | 4.5 | 1.0 | | | | | | | 5.5 | 9.5 | 2.5 |
| | | 44.8 | | | | | | | | | | | | | | | | | |
| TAILINGS 2.10 (S1) | | | | | | | | | | | | | | | | | | | |
| 1301 | +6 | 34.9 | 3.8 | | 3.4 | 2.0 | 92.6 | 0.5 | 2.8 | 6.3 | 10.0 | 63.4 | 92.4 | | | | | | |
| 1302 | -6 + 10 | 268.3 | 29.5 | | 2.4 | 2.8 | 93.4 | 2.7 | 30.5 | 49.0 | | | | 5.7 | 63.1 | 96.1 | | | |
| 1303 | -10 | 222.2 | 24.5 | | 1.6 | 3.0 | 96.4 | 1.5 | 27.3 | 41.1 | | | | | | | 3.2 | 57.7 | 97.4 |
| | | 525.4 | 100.0 | | 25.9 | 2.7 | 56.2 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

TOTAL 908.7

BACK CALCULATION OF +20 MESH HEAD SAMPLE FROM HMS RESULTS

| LAB NO. | MESH SIZE | WT. | WT.% | ACCUM WT.% | GRADE K20 | GRADE MI | GRADE HACL | DISTIBUTION K20 | DISTIBUTION MI | DISTIBUTION HACL |
|---|---|---|---|---|---|---|---|---|---|---|
| | +6 | 54.8 | 6.0 | 6.0 | 21.6 | 2.0 | 63.8 | 5.0 | 4.4 | 6.8 |
| | -6 + 10 | 451.8 | 49.7 | 55.7 | 25.1 | 2.6 | 57.7 | 48.0 | 48.3 | 51.0 |
| | -10 | 402.1 | 44.3 | 100.0 | 27.5 | 2.9 | 55.6 | 46.9 | 47.3 | 42.1 |
| | TOTAL | 908.7 | 100.0 | | 25.9 | 2.7 | 56.2 | 100.0 | 100.0 | 100.0 |

[redacted]

**+20 MESH FRACTION OF HEAD SAMPLE**

| LAB NO. | MESH SIZE | WT. | WT.% | ACCUM WT.% | GRADE K20 | GRADE WI | GRADE MACL | DISTRIBUTION K20 | DISTRIBUTION WI | DISTRIBUTION MACL |
|---|---|---|---|---|---|---|---|---|---|---|
| | +6 | 36.0 | 5.8 | 5.8 | 19.7 | 2.8 | 66.1 | 4.5 | 5.9 | 6.7 |
| | -6 + 10 | 291.7 | 45.8 | 51.6 | 26.1 | 2.5 | 59.4 | 43.2 | 42.1 | 47.9 |
| | -10 | 308.1 | 48.4 | 100.0 | 27.6 | 2.9 | 53.4 | 52.3 | 52.0 | 45.4 |
| | TOTAL | 636.6 | 100.0 | | 25.5 | 2.7 | 56.9 | 100.0 | 100.0 | 100.0 |

**MRD RESULTS**

| LAB NO. | MESH SIZE | WT. | WT.% | ACCUM WT.% | GRADE K20 | GRADE WI | GRADE MACL | OVERALL DISTRIBUTION K20 | OVERALL DISTRIBUTION WI | OVERALL DISTRIBUTION MACL | SCREEN FRACTION DISTRIBUTION +6 MESH K20 | SCREEN FRACTION DISTRIBUTION +6 MESH WI | SCREEN FRACTION DISTRIBUTION +6 MESH MACL | SCREEN FRACTION DISTRIBUTION -6 + 10 MESH K20 | SCREEN FRACTION DISTRIBUTION -6 + 10 MESH WI | SCREEN FRACTION DISTRIBUTION -6 + 10 MESH MACL | SCREEN FRACTION DISTRIBUTION -10 MESH K20 | SCREEN FRACTION DISTRIBUTION -10 MESH WI | SCREEN FRACTION DISTRIBUTION -10 MESH MACL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FLOAT 2.03 (F) | | | | | | | | | | | | | | | | | | | |
| 1311 | +6 | 13.4 | 1.0 | | 60.2 | 1.9 | 2.9 | 3.2 | 0.8 | 0.1 | 76.0 | 20.0 | 1.2 | | | | | | |
| 1312 | -6 + 10 | 159.0 | 16.1 | | 60.7 | 2.6 | 1.3 | 38.4 | 12.8 | 0.4 | | | | 85.2 | 29.0 | 0.7 | | | |
| 1313 | -10 | 186.9 | 18.8 | | 60.6 | 3.4 | 0.6 | 44.9 | 19.8 | 0.2 | | | | | | | 80.5 | 38.2 | 0.5 |
| | | 360.1 | | | | | | | | | | | | | | | | | |
| MIDDLINGS 2.10 (MI) | | | | | | | | | | | | | | | | | | | |
| 1314 | +6 | 4.0 | 0.4 | | 35.6 | 4.0 | 39.6 | 0.6 | 0.5 | 0.3 | 13.4 | 12.5 | 6.9 | | | | | | |
| 1315 | -6 + 10 | 22.9 | 2.3 | | 39.0 | 5.5 | 32.8 | 3.5 | 3.9 | 1.3 | | | | 7.8 | 8.9 | 2.7 | | | |
| 1316 | -10 | 18.6 | 1.9 | | 46.2 | 7.6 | 19.3 | 3.4 | 4.5 | 0.6 | | | | | | | 6.7 | 8.6 | 1.5 |
| | | 45.5 | | | | | | | | | | | | | | | | | |
| TAILINGS 2.10 (SI) | | | | | | | | | | | | | | | | | | | |
| 1317 | +6 | 33.2 | 3.3 | | 3.4 | 2.6 | 92.1 | 0.4 | 2.7 | 5.5 | 10.6 | 67.4 | 94.0 | | | | | | |
| 1318 | -6 + 10 | 292.4 | 29.5 | | 2.7 | 3.0 | 92.7 | 3.1 | 27.5 | 48.4 | | | | 7.0 | 62.1 | 96.6 | | | |
| 1319 | -10 | 260.4 | 26.3 | | 2.4 | 3.4 | 92.9 | 2.4 | 27.5 | 43.2 | | | | | | | 4.8 | 53.1 | 98.1 |
| | | 986.0 | 100.0 | | 25.5 | 3.2 | 56.5 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| | TOTAL | 991.6 | | | | | | | | | | | | | | | | | |

**BACK CALCULATION OF +20 MESH HEAD SAMPLE FROM MRD RESULTS**

| LAB NO. | MESH SIZE | WT. | WT.% | ACCUM WT.% | GRADE K20 | GRADE WI | GRADE MACL | DISTRIBUTION K20 | DISTRIBUTION WI | DISTRIBUTION MACL |
|---|---|---|---|---|---|---|---|---|---|---|
| | +6 | 50.6 | 5.1 | 5.1 | 21.0 | 2.5 | 64.3 | 4.2 | 4.0 | 5.0 |
| | -6 + 10 | 473.1 | 47.9 | 53.0 | 26.0 | 3.0 | 59.1 | 45.1 | 44.3 | 50.1 |
| | -10 | 465.9 | 47.0 | 100.0 | 27.5 | 3.5 | 53.0 | 50.7 | 51.7 | 44.1 |
| | TOTAL | 991.6 | 100.0 | | 25.5 | 3.2 | 56.5 | 100.0 | 100.0 | 100.0 |

+20 MESH FRACTION OF HEAD SAMPLE

| LAB NO. | MESH SIZE | WT. | WT.% | ACCUM WT.% | GRADE K20 | GRADE VI | GRADE HACL | DISTRIBUTION K20 | DISTRIBUTION VI | DISTRIBUTION HACL |
|---|---|---|---|---|---|---|---|---|---|---|
| | +6 | 67.0 | 7.0 | 7.0 | 18.9 | 2.8 | 67.3 | 5.4 | 6.0 | 8.1 |
| | -6 + 10 | 475.4 | 49.1 | 56.0 | 23.2 | 3.3 | 60.0 | 46.7 | 69.4 | 50.6 |
| | -10 | 426.0 | 44.0 | 100.0 | 26.6 | 3.3 | 54.6 | 47.9 | 44.6 | 41.3 |
| | TOTAL | 968.0 | 100.0 | | 24.4 | 3.2 | 58.2 | 100.0 | 100.0 | 100.0 |

AND RESULTS

| LAB NO. | MESH SIZE | WT. | WT.% | ACCUM WT.% | GRADE K20 | GRADE VI | GRADE HACL | OVERALL DISTRIBUTION K20 | OVERALL DISTRIBUTION VI | OVERALL DISTRIBUTION HACL | SCREEN FRACTION DISTRIBUTION +6 MESH K20 | SCREEN FRACTION DISTRIBUTION +6 MESH VI | SCREEN FRACTION DISTRIBUTION +6 MESH HACL | SCREEN FRACTION DISTRIBUTION -6 + 10 MESH K20 | SCREEN FRACTION DISTRIBUTION -6 + 10 MESH VI | SCREEN FRACTION DISTRIBUTION -6 + 10 MESH HACL | SCREEN FRACTION DISTRIBUTION -10 MESH K20 | SCREEN FRACTION DISTRIBUTION -10 MESH VI | SCREEN FRACTION DISTRIBUTION -10 MESH HACL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FLOAT 2.03 (F) | | | | | | | | | | | | | | | | | | | |
| 1320 | +6 | 17.0 | 1.3 | | 60.0 | 1.2 | 2.6 | 3.2 | 0.7 | 0.1 | 72.6 | 12.2 | 0.9 | | | | | | |
| 1321 | -6 + 10 | 290.0 | 14.8 | | 61.1 | 1.6 | 1.0 | 36.7 | 10.1 | 0.4 | | | | 86.9 | 24.5 | 0.9 | | | |
| 1322 | -10 | 269.3 | 19.9 | | 61.4 | 2.1 | 0.7 | 49.7 | 18.2 | 0.2 | | | | | | | 93.1 | 34.2 | 0.5 |
| | | 487.1 | | | | | | | | | | | | | | | | | |
| MIDDLINGS 2.10 (S2) | | | | | | | | | | | | | | | | | | | |
| 1323 | +6 | 6.5 | 0.5 | | 36.5 | 3.0 | 39.2 | 0.7 | 0.6 | 0.3 | 15.9 | 11.4 | 5.1 | | | | | | |
| 1324 | -6 + 10 | 36.6 | 2.6 | | 38.3 | 4.6 | 33.4 | 3.1 | 3.0 | 1.1 | | | | 7.4 | 8.4 | 3.6 | | | |

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | | | |
| | | | 69.9 | | | | | | | | | | | | | | | | | |
| TAILINGS | 2.40 | (SG) | | | | | | | | | | | | | | | | | | |
| 1226 | | 46 | 31.3 | 3.6 | | 3.3 | 2.5 | 92.2 | 0.5 | 4.1 | 6.0 | 11.5 | 76.3 | 94.0 | | | | | | |
| 1227 | | -6 + 10 | 300.5 | 28.4 | | 2.1 | 2.2 | 94.5 | 2.4 | 27.2 | 45.7 | | | | 5.6 | 44.1 | 96.7 | | | |
| 1228 | | -10 | 300.3 | 28.1 | | 1.3 | 2.6 | 95.0 | 1.4 | 31.2 | 45.7 | | | | | | | 2.7 | 38.5 | 98.4 |
| | | | 816.1 | 100.0 | | 24.6 | 2.3 | 38.7 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| | | TOTAL | 1253.1 | | | | | | | | | | | | | | | | | |

BACK CALCULATION OF +20 FEED HEAD SAMPLE FROM HHD RESULTS

| LAB NO. | FEED SIZE | WT. | WT.% | ACCUM WT.% | GRADE K20 | GRADE SI | GRADE HACL | DISTRIBUTION K20 | DISTRIBUTION SI | DISTRIBUTION HACL |
|---|---|---|---|---|---|---|---|---|---|---|
| | 46 | 75.6 | 5.6 | 5.6 | 19.7 | 2.2 | 66.6 | 4.5 | 5.4 | 6.3 |
| | -6 + 10 | 611.1 | 45.2 | 50.8 | 23.0 | 2.1 | 61.9 | 42.2 | 41.2 | 47.3 |
| | -10 | 666.4 | 49.2 | 100.0 | 26.6 | 2.5 | 33.3 | 53.3 | 53.4 | 46.4 |
| | TOTAL | 1353.1 | 100.0 | | 24.6 | 2.3 | 38.7 | 100.0 | 100.0 | 100.0 |

REPORT DATE : 26-Jun-87

ROUGHER FEED

+20 MESH FRACTION OF HEAD SAMPLE

| LAB NO. | MESH SIZE | WT. | WT.% | ACCUM WT.% | GRADE K20 | GRADE UI | GRADE NACL | DISTRIBUTION K20 | DISTRIBUTION UI | DISTRIBUTION NACL |
|---|---|---|---|---|---|---|---|---|---|---|
| | +6 | 41.5 | 6.9 | 6.9 | 19.3 | 2.1 | 67.3 | 5.3 | 7.9 | 7.8 |
| | -6 + 10 | 277.9 | 45.9 | 52.8 | 22.9 | 2.0 | 61.7 | 42.3 | 50.8 | 48.2 |
| | -10 | 286.0 | 47.2 | 100.0 | 27.6 | 1.6 | 54.0 | 52.4 | 41.3 | 44.0 |
| | TOTAL | 605.4 | 100.0 | | 24.9 | 1.8 | 58.8 | 100.0 | 100.0 | 100.0 |

MRB RESULTS

| LAB NO. | MESH SIZE | WT. | WT.% | ACCUM WT.% | GRADE K20 | GRADE UI | GRADE NACL | OVERALL DISTRIBUTION K20 | OVERALL DISTRIBUTION UI | OVERALL DISTRIBUTION NACL | SCREEN FRACTION DISTRIBUTION +6 MESH K20 | SCREEN FRACTION DISTRIBUTION +6 MESH UI | SCREEN FRACTION DISTRIBUTION +6 MESH NACL | SCREEN FRACTION DISTRIBUTION -6 + 10 MESH K20 | SCREEN FRACTION DISTRIBUTION -6 + 10 MESH UI | SCREEN FRACTION DISTRIBUTION -6 + 10 MESH NACL | SCREEN FRACTION DISTRIBUTION -10 MESH K20 | SCREEN FRACTION DISTRIBUTION -10 MESH UI | SCREEN FRACTION DISTRIBUTION -10 MESH NACL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | +6 | 41.5 | 6.9 | 6.9 | 19.3 | 2.1 | 67.3 | 5.3 | 7.9 | 7.8 | | | | | | | | | |
| | -6 + 10 | 277.9 | 45.9 | 52.8 | 22.9 | 2.0 | 61.7 | 42.3 | 50.8 | 48.2 | | | | | | | | | |
| | -10 | 286.0 | 47.2 | 100.0 | 27.6 | 1.6 | 54.0 | 52.4 | 41.3 | 44.0 | | | | | | | | | |
| | TOTAL | 605.4 | 100.0 | | 24.9 | 1.8 | 58.8 | 100.0 | 100.0 | 100.0 | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FLOAT 2.03 (F) | | | | | | | | | | | | | | | | | | | |
| 1343 | +6 | 14.9 | 1.6 | | 61.4 | 0.6 | 2.3 | 3.9 | 0.8 | 0.1 | 90.0 | 13.1 | 1.1 | | | | | | |
| 1344 | -6 + 10 | 102.8 | 15.6 | | 62.1 | 0.7 | 1.0 | 38.1 | 7.9 | 0.3 | | | | 88.1 | 15.4 | 0.5 | | | |
| 1345 | -10 | 178.6 | 19.3 | | 62.0 | 0.6 | 1.2 | 47.5 | 0.9 | 0.6 | | | | | | | 90.7 | 21.0 | 0.9 |
| | | 336.3 | | | | | | | | | | | | | | | | | |
| MIDDLINGS 2.10 (82) | | | | | | | | | | | | | | | | | | | |
| 1346 | +6 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | |
| 1347 | -6 + 10 | 20.2 | 2.2 | | 37.7 | 3.2 | 37.1 | 3.3 | 5.2 | 1.4 | | | | 7.6 | 10.1 | 2.9 | | | |
| 1348 | -10 | 19.2 | 2.1 | | 48.4 | 3.3 | 20.1 | 4.0 | 5.1 | 0.7 | | | | | | | 7.6 | 11.9 | 1.6 |
| | | 39.4 | | | | | | | | | | | | | | | | | |
| TAILINGS 2.10 (81) | | | | | | | | | | | | | | | | | | | |
| 1349 | +6 | 33.9 | 3.7 | | 3.0 | 1.8 | 93.4 | 0.4 | 5.0 | 5.9 | 10.0 | 86.9 | 98.9 | | | | | | |
| 1350 | -6 + 10 | 262.5 | 28.7 | | 1.7 | 1.8 | 95.5 | 1.9 | 38.5 | 46.9 | | | | 4.6 | 74.5 | 96.6 | | | |
| 1351 | -10 | 243.9 | 26.6 | | 0.8 | 1.5 | 97.3 | 0.9 | 29.5 | 44.3 | | | | | | | 1.7 | 67.1 | 97.5 |
| | | 540.3 | 100.0 | | 25.4 | 1.4 | 38.4 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| TOTAL | | 916.0 | | | | | | | | | | | | | | | | | |

BACK CALCULATION OF +20 MESH HEAD SAMPLE FROM MMD RESULTS

| LAB NO. | MESH SIZE | WT. | WT.% | ACCUM WT.% | GRADE K20 | GRADE HI | GRADE HACL | DISTRIBUTION K20 | DISTRIBUTION HI | DISTRIBUTION HACL |
|---|---|---|---|---|---|---|---|---|---|---|
| | +6 | 48.8 | 5.3 | 5.3 | 20.8 | 1.5 | 68.6 | 4.4 | 5.8 | 6.0 |
| | -6 + 10 | 425.5 | 46.5 | 51.8 | 23.7 | 1.5 | 61.0 | 43.2 | 51.7 | 48.5 |
| | -10 | 441.7 | 48.2 | 100.0 | 27.6 | 1.2 | 38.1 | 52.4 | 42.5 | 45.5 |
| | TOTAL | 916.0 | 100.0 | | 25.4 | 1.4 | 38.4 | 100.0 | 100.0 | 100.0 |

[redacted] DATE [redacted]-87

ROUGHER CONCENTRATE

+20 MESH FRACTION OF HEAD SAMPLE

| LAB NO. | MESH SIZE | WT. | WT.% | ACCUM WT.% | GRADE K20 | GRADE WI | GRADE MACL | DISTRIBUTION K20 | DISTRIBUTION WI | DISTRIBUTION MACL |
|---|---|---|---|---|---|---|---|---|---|---|
| | +6 | 1.5 | 0.2 | 0.2 | 62.0 | 0.5 | 0.2 | 0.2 | 0.1 | 0.0 |
| | -6 + 10 | 223.1 | 29.3 | 29.5 | 62.5 | 0.6 | 0.5 | 29.5 | 21.3 | 14.6 |
| | -10 | 536.2 | 70.5 | 100.0 | 61.0 | 0.9 | 1.3 | 70.3 | 78.6 | 85.4 |
| | TOTAL | 760.8 | 100.0 | | 62.0 | 0.8 | 1.1 | 100.0 | 100.0 | 100.0 |

HMS RESULTS

| LAB NO. | MESH SIZE | WT. | WT.% | ACCUM WT.% | GRADE K20 | GRADE WI | GRADE MACL | OVERALL DISTRIBUTION K20 | OVERALL DISTRIBUTION WI | OVERALL DISTRIBUTION MACL | SCREEN FRACTION DISTRIBUTION +6 MESH K20 | SCREEN FRACTION DISTRIBUTION +6 MESH WI | SCREEN FRACTION DISTRIBUTION +6 MESH MACL | SCREEN FRACTION DISTRIBUTION -6 + 10 MESH K20 | SCREEN FRACTION DISTRIBUTION -6 + 10 MESH WI | SCREEN FRACTION DISTRIBUTION -6 + 10 MESH MACL | SCREEN FRACTION DISTRIBUTION -10 MESH K20 | SCREEN FRACTION DISTRIBUTION -10 MESH WI | SCREEN FRACTION DISTRIBUTION -10 MESH MACL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FLOAT 2.65 (F) | | | | | | | | | | | | | | | | | | | |
| 1361 | +6 | 1.3 | 0.1 | | 62.6 | 0.4 | 0.6 | 0.1 | 0.1 | 0.1 | 100.0 | 100.0 | 100.0 | | | | | | |
| 1362 | -6 + 101 | 365.7 | 30.6 | | 62.6 | 0.6 | 0.6 | 30.0 | 16.5 | 16.0 | | | | 99.4 | 84.6 | 71.8 | | | |
| 1363 | -10 | 795.6 | 66.5 | | 62.7 | 0.6 | 0.2 | 67.2 | 53.5 | 14.9 | | | | | | | 97.6 | 66.6 | 19.2 |
| | | 1162.6 | | | | | | | | | | | | | | | | | |
| HEAD,ENHD 2.10 (SI) | | | | | | | | | | | | | | | | | | | |
| 1364 | +6 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | |
| 1365 | -6 + 101 | 3.2 | 0.3 | | 64.9 | 7.2 | 21.0 | 0.2 | 2.8 | 5.4 | | | | 0.6 | 14.4 | 26.4 | | | |
| 1366 | -10 | 25.3 | 2.1 | | 64.9 | 7.2 | 21.0 | 1.5 | 22.2 | 63.1 | | | | | | | 2.2 | 27.6 | 55.4 |
| | | 28.5 | | | | | | | | | | | | | | | | | |
| TAIL,ENHD 2.10 (SI) | | | | | | | | | | | | | | | | | | | |
| 1367 | +6 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | |
| 1368 | -6 + 101 | 0.2 | 0.0 | | 20.3 | 0.1 | 53.4 | 0.0 | 0.2 | 0.8 | | | | 0.0 | 1.0 | 3.7 | | | |
| 1369 | -10 | 4.7 | 0.4 | | 20.3 | 0.1 | 53.4 | 0.2 | 0.7 | 19.7 | | | | | | | 0.2 | 5.8 | 25.3 |
| | | 4.9 | 100.0 | | 62.1 | 0.7 | 1.1 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

TOTAL 1196.0

BACK CALCULATION OF +20 MESH HEAD SAMPLE FROM HMS RESULTS

| LAB NO. | MESH SIZE | WT. | WT.% | ACCUM WT.% | GRADE K20 | GRADE WI | GRADE MACL | DISTRIBUTION K20 | DISTRIBUTION WI | DISTRIBUTION MACL |
|---|---|---|---|---|---|---|---|---|---|---|
| | +6 | 1.7 | 0.1 | 0.1 | 62.6 | 0.4 | 0.6 | 0.1 | 0.1 | 0.1 |
| | -6 + 101 | 369.1 | 30.9 | 31.0 | 62.6 | 0.4 | 0.8 | 31.0 | 19.6 | 22.3 |
| | -10 | 825.6 | 69.0 | 100.0 | 61.9 | 0.8 | 1.2 | 68.9 | 80.4 | 77.6 |
| | TOTAL | 1196.0 | 100.0 | | 62.1 | 0.7 | 1.1 | 100.0 | 100.0 | 100.0 |

[redacted] REPORT DATE : [redacted]-87

ROUGHER TAILS

+20 MESH FRACTION OF HEAD SAMPLE

| LAB NO. | MESH SIZE | WT. | WT.% | ACCUM WT.% | GRADE K20 | GRADE WI | GRADE MACL | DISTRIBUTION K20 | DISTRIBUTION WI | DISTRIBUTION MACL |
|---|---|---|---|---|---|---|---|---|---|---|
| | +6 | 57.0 | 7.6 | 7.6 | 17.3 | 2.3 | 70.3 | 11.2 | 9.9 | 6.7 |
| | -6 + 101 | 409.0 | 53.9 | 61.5 | 16.2 | 2.0 | 72.4 | 74.2 | 61.6 | 49.0 |
| | -10 | 293.1 | 38.5 | 100.0 | 4.5 | 1.3 | 91.7 | 14.6 | 28.5 | 44.3 |
| | TOTAL | 760.7 | 100.0 | | 11.7 | 1.7 | 79.7 | 100.0 | 100.0 | 100.0 |

HMS RESULTS

| LAB NO. | MESH SIZE | WT. | WT.% | ACCUM WT.% | GRADE K20 | GRADE WI | GRADE MACL | OVERALL DISTRIBUTION K20 | OVERALL DISTRIBUTION WI | OVERALL DISTRIBUTION MACL | SCREEN FRACTION DISTRIBUTION +6 MESH K20 | SCREEN FRACTION DISTRIBUTION +6 MESH WI | SCREEN FRACTION DISTRIBUTION +6 MESH MACL | SCREEN FRACTION DISTRIBUTION -6 + 10 MESH K20 | SCREEN FRACTION DISTRIBUTION -6 + 10 MESH WI | SCREEN FRACTION DISTRIBUTION -6 + 10 MESH MACL | SCREEN FRACTION DISTRIBUTION -10 MESH K20 | SCREEN FRACTION DISTRIBUTION -10 MESH WI | SCREEN FRACTION DISTRIBUTION -10 MESH MACL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FLOAT 2.65 (F) | | | | | | | | | | | | | | | | | | | |
| 1352 | +6 | 26.4 | 2.3 | | 61.0 | 1.0 | 2.5 | 10.9 | 1.5 | 0.1 | 78.1 | 15.7 | 0.9 | | | | | | |
| 1353 | -6 + 101 | 144.6 | 12.8 | | 61.3 | 0.9 | 2.1 | 66.0 | 7.7 | 0.3 | | | | 88.2 | 13.5 | 0.7 | | | |
| 1354 | -10 | 16.3 | 1.4 | | 61.4 | 1.2 | 1.6 | 6.8 | 1.2 | 0.0 | | | | | | | 60.5 | 3.5 | 0.1 |
| | | 187.3 | | | | | | | | | | | | | | | | | |
| HEAD,ENHD 2.10 (SI) | | | | | | | | | | | | | | | | | | | |
| 1355 | +6 | 8.0 | 0.7 | | 33.9 | 1.5 | 45.0 | 1.8 | 0.7 | 0.4 | 13.1 | 7.1 | 6.9 | | | | | | |
| 1356 | -6 + 101 | 37.3 | 3.3 | | 30.9 | 3.0 | 35.5 | 9.8 | 6.6 | 1.5 | | | | 13.1 | 11.6 | 2.9 | | | |
| 1357 | -10 | 8.9 | 0.8 | | 40.8 | 3.6 | 31.8 | 2.5 | 1.9 | 0.3 | | | | | | | 21.9 | 5.7 | 0.8 |
| | | 54.2 | | | | | | | | | | | | | | | | | |
| TAIL,ENHD 2.10 (SI) | | | | | | | | | | | | | | | | | | | |
| 1358 | +6 | 73.4 | 6.5 | | 2.5 | 1.7 | 94.4 | 1.2 | 7.6 | 7.8 | 0.7 | 77.2 | 94.2 | | | | | | |
| 1359 | -6 + 101 | 463.4 | 40.9 | | 1.6 | 1.5 | 96.0 | 5.0 | 42.0 | 50.4 | | | | 6.6 | 74.9 | 96.5 | | | |
| 1360 | -10 | 350.0 | 31.3 | | 0.0 | 1.4 | 97.3 | 2.0 | 36.0 | 39.1 | | | | | | | 17.6 | 90.8 | 99.1 |
| | | 891.8 | 100.0 | | 13.0 | 1.5 | 77.9 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

TOTAL 1133.3

BACK CALCULATION OF +20 MESH HEAD SAMPLE FROM HMS RESULTS

| LAB NO. | MESH SIZE | WT. | WT.% | ACCUM WT.% | GRADE K20 | GRADE WI | GRADE MACL | DISTRIBUTION K20 | DISTRIBUTION WI | DISTRIBUTION MACL |
|---|---|---|---|---|---|---|---|---|---|---|
| | +6 | 107.0 | 9.5 | 9.5 | 19.1 | 1.5 | 68.2 | 14.0 | 9.8 | 8.3 |
| | -6 + 101 | 645.3 | 56.9 | 66.5 | 17.1 | 1.5 | 71.4 | 74.8 | 57.1 | 57.2 |
| | -10 | 380.2 | 33.5 | 100.0 | 4.4 | 1.5 | 91.7 | 11.2 | 33.1 | 34.5 |
| | TOTAL | 1133.3 | 100.0 | | 13.0 | 1.5 | 77.9 | 100.0 | 100.0 | 100.0 |